Note

Before using this information and the product it supports, be sure to read the general information under “Safety Information” on page xii, and “Notices” on page 175.

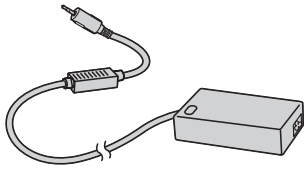
Note for Using Your Computer in Japan

If you are using a modem in Japan, specify the country as “Japan” in the “Dialing Properties.” window under the “Modem Properties” window. Using the modem functions with another setting is a violation of the Japanese Telecommunication Business Law.

$ The AC Adapter complies with the Electrical Appliance and Material Control Law of Japan.

$ Rating: Input ac 100 V 50/60 Hz
$ Output dc 16 V

$ Certificate number (▽): 91-56055



First Edition (August 1998)

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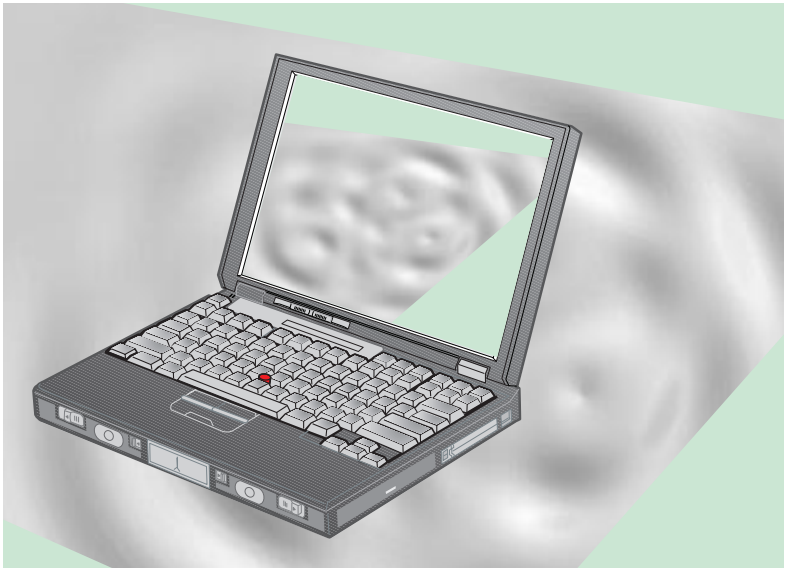
Thank You for Selecting an IBM ThinkPad 770X Computer

We have developed this ThinkPad computer to meet both your technical requirements and your high expectations.



Functional Highlights

Compact design with core technology

This powerful notebook computer includes a number of advanced technologies and user-friendly functions to make your computing experience more productive and pleasurable. Several of these functions are highlighted below. For additional details and functions, refer to the respective chapters in this book.

High-speed processor

The Intel Pentium II 300-MHz processor with AGP (Accelerated Graphics Port) support enables high-speed data processing and advanced performance.

Large-capacity hard disk drive

The 8.1-GB customer-upgradable hard disk drive can respond to a wide variety of your business demands.

Large color LCD

The 13.7- or 14.1-inch TFT (thin-film transistor) display with high resolution (1024x768 or 1280x1024) provides clear and brilliant text and graphics.

Lithium-ion battery pack

The large-capacity lithium-ion battery pack extends the operating time of your computer, further enhancing its portability.

DVD-ROM drive

A new slim DVD-ROM (digital versatile disc ROM) drive plays presentations recorded with the DVD format, and it also plays standard CD-ROM discs.

Audio with 3D stereo sound

Your computer is equipped with internal audio record and playback capabilities, including 3D (three-dimensional) audio from just two speakers. When you enable the 3D stereo feature, sounds will appear to be generated all around you, even though only two speakers are used.

The model equipped with a digital signal processor (DSP); features a high-quality MIDI wave table synthesizer with 128 instruments and up to 32 voices.

To use the audio function → “Basic” in the *Online User's Guide*.

ThinkPad modem

The ThinkPad modem enables you to send or receive data, faxes, and voice over the telephone line. This modem uses a DSP, and its software can be upgraded, allowing great flexibility.

To use the ThinkPad modem function → “Basic” in the *Online User's Guide*.

TrackPoint with enhanced controls

Your computer has an enhanced TrackPoint function that enables you to make selections merely by pressing on the TrackPoint. A new center button converts the TrackPoint into a scroll controlling device or a magnifying glass on the screen.

To use the TrackPoint → “TrackPoint” on page 10.

PC Card support

Your computer provides two PC Card slots that accept a 16-bit PC Card, CardBus Card, or Zoomed Video Card.

To install a PC Card → “Installing a PC Card” on page 78.

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About This Book

This book contains information that will help you operate the IBM ThinkPad 770X computer. Be sure to read the *ThinkPad Setup Guide* and Chapter 1 of this book before using the computer.

Chapter 1. "Getting Familiar with Your Computer," acquaints you with the basic features of your computer.

Chapter 2. "Extending the Features of Your Computer," provides information on installing options and using your computer's high-technology features.

Chapter 3. "Protecting Your Computer," provides information on using passwords, identifying yourself with the Personalization Editor, and using locks.

Chapter 4. "Solving Computer Problems," describes what to do when you have a computer problem. The chapter includes a troubleshooting guide.

Appendix A. "Features and Specifications," describes the features and specifications associated with your computer, including information on power cords.

Appendix B. "Product Warranties and Notices," contains the warranty statements for your computer and notices for this book.

The book concludes with an ***index***.

Icons Used in This Book

For procedures or information unique to the operating system installed in your computer:

Information for Microsoft Windows 98 users

Information for IBM Operating System/2 (OS/2) users

Information for Microsoft Windows 95 users

Information for IBM DOS users

Information for Microsoft Windows NT users

Information for Microsoft Windows 3.1 users

Safety Information

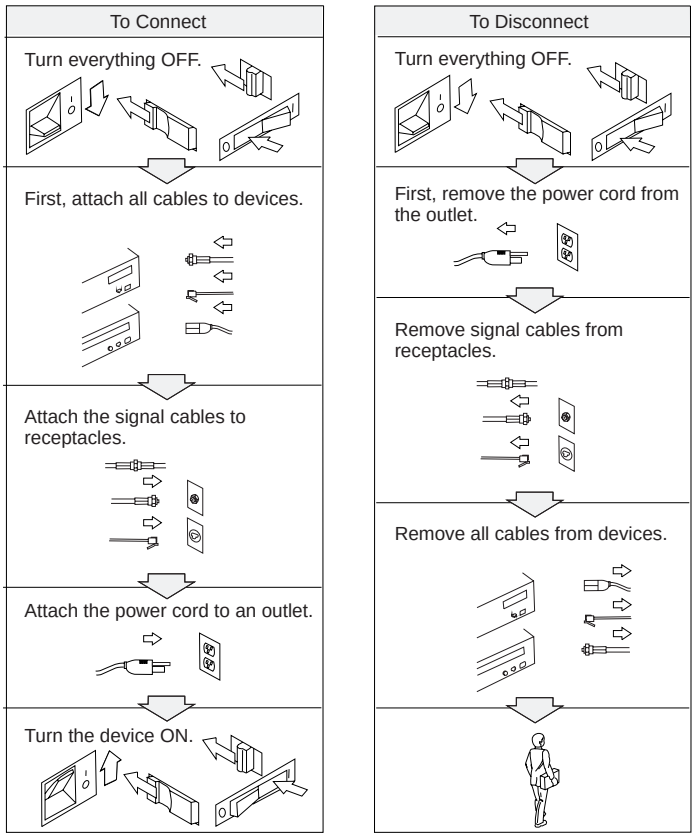
Note: In the U.K., by law:

The telephone line cable must be connected after the power cord.
The power cord must be disconnected after the telephone line cable.

Electrical Safety Notice

DANGER

Electrical current from power, telephone, and communication cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving, or opening the covers of this product or attached devices. The 3-pin power cord must be used with a properly grounded outlet.



DANGER

Do not disassemble, incinerate, or short-circuit the rechargeable battery pack. Do not put it in trash that is disposed of in landfills. Dispose of it as required by local ordinances or regulations. In the United States, call IBM at 1-800-IBM-4333 for information on disposal.

DANGER

The lithium battery (IBM P/N 12J0453 UL-recognized component—File No. MH12210) can be replaced only by your dealer or an IBM service representative. It contains lithium and can explode if not properly used, handled, or disposed of. Do not: (1) throw or immerse into water, (2) heat to more than 100°C (212°F), or (3) repair or disassemble. Dispose of it as required by local ordinances or regulations.

CAUTION:
The fluorescent lamp in the liquid crystal display (LCD) contains mercury. Do not put it in trash that is disposed of in landfills. Dispose of it as required by local ordinances or regulations.

The LCD is made of glass, and rough handling or dropping the computer can cause the LCD to break. If the LCD breaks and the internal fluid gets into your eyes or on your hands, immediately wash the affected areas with water for at least 15 minutes; then get medical care if any symptoms are present after washing.

Laser Compliance Statement

The CD-ROM or DVD-ROM drive in the IBM ThinkPad 770X computer is a laser product. The drive's classification label (shown below) is located on the top of the drive.

CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
APPAREIL A LASER DE CLASSE 1
KLASS 1 LASER APPARAT

The drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class I laser products.

In other countries, the drive is certified to conform to the requirements of EN60825.

DANGER

Do not open the CD-ROM or DVD-ROM drive; no user adjustments or serviceable parts are inside.

Use of controls, adjustments, or the performance of procedures other than those specified might result in hazardous radiation exposure.

Class 1 laser products are not considered to be hazardous. The CD-ROM or DVD-ROM drive has an internal, Class 1, 0.5-milliwatt, aluminum gallium-arsenide laser that operates at a wavelength of 760 to 810 nanometers. The design of the laser system and the CD-ROM or DVD-ROM drive ensures that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.

Chapter 1 Getting Familiar with Your Computer

This chapter provides basic information about your computer.

To power off the computer, hold the power switch for just a second and release it. Wait at least 5 seconds before powering on again (or resuming normal operation from suspend or hibernation mode).

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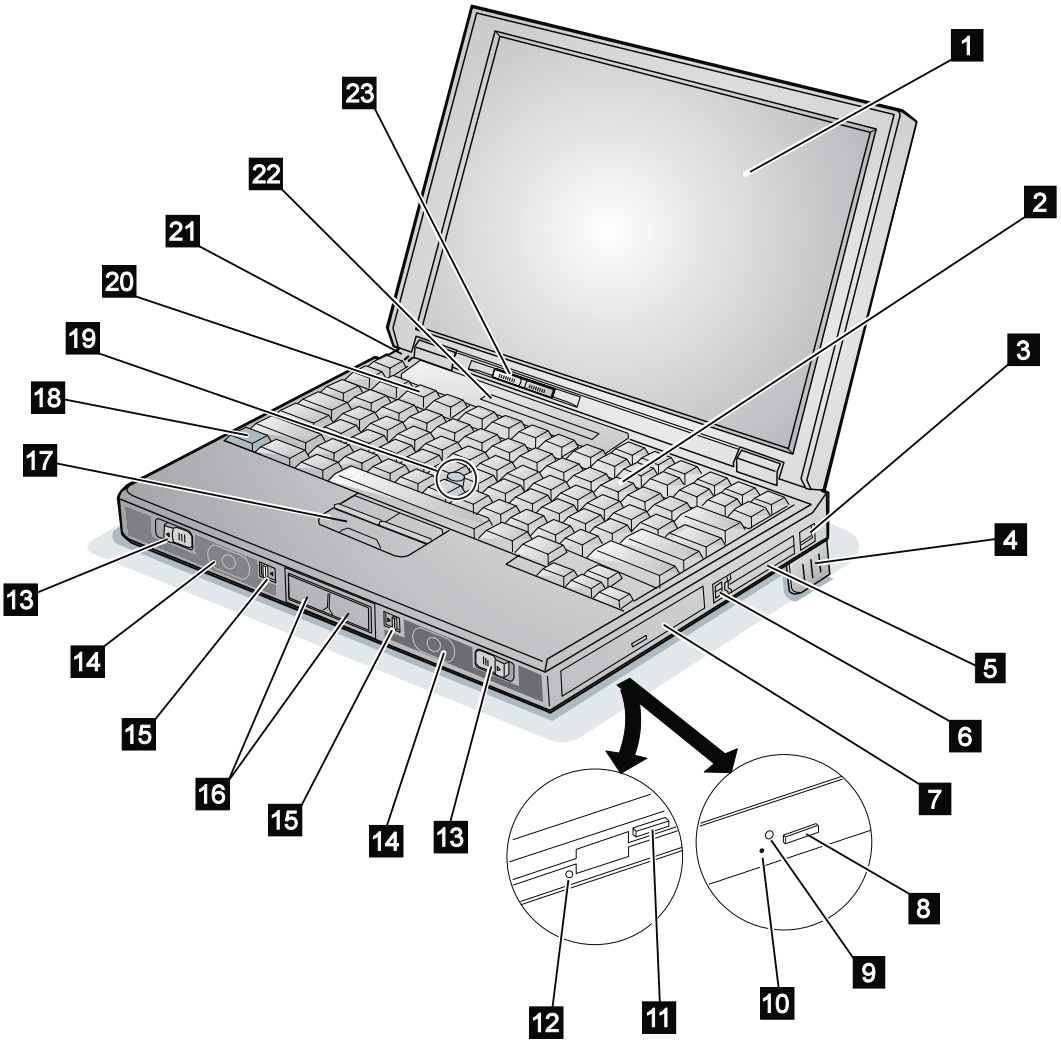
Identifying the Hardware Features

Front View



1 The **liquid crystal display (LCD)** displays text and graphics.

2 The **numeric keypad** is used for typing numbers in **NumLk** mode.

3 The **internal modem port** (also called the **telephone jack**), provided on some models, is used for connecting your computer to a telephone line.

4 The **legs** can be extended to angle the keyboard for more comfortable typing.

5 The **PC Card slots** accept a PC Card, CardBus Card, or Zoomed Video (ZV) Card. The **eject buttons** 6 eject the PC Cards from the slots.

7 The **UltraBay II** is used for inserting various devices such as a CD-ROM drive, diskette drive, DVD-ROM drive, a secondary hard disk drive, and a secondary battery pack.

8 The **eject button** ejects the tray from the CD-ROM or DVD-ROM drive.

9 The **drive-in-use indicator** goes on when data is being read from a CD-ROM or a DVD-ROM in the CD-ROM or DVD-ROM drive. Do not enter suspend mode or eject a disc when this indicator is on.

1 The **emergency eject hole** is used to eject the CD-ROM or DVD-ROM tray when it does not open with the eject button 8 . Insert a pin to eject the tray.

11 The **diskette eject button** ejects a diskette from the diskette drive.

12 The **diskette drive-in-use indicator** goes on when data is being written to or is being read from a diskette. Do not enter suspend mode or eject a diskette when this indicator is on.

13 The left and right **cover release latches** open the LCD when they are slid outward.

14 The left and right **internal speakers** generate stereo sound.

15 The left and right **release latches** release the left and right **bay eject levers** 16 , which release any device in the battery bay or the UltraBay II, respectively. The right release latch contains a **bay LED** that indicates when you can safely remove a device from the UltraBay II.

17 The **left click**, **right click**, and **center click buttons** are used to select items on the screen, double-click and bring up context menus. They work like mouse click buttons. The center click button (below the other buttons) is used to activate the enhanced TrackPoint functions.

18 The **Fn key** is used with the function keys (F1–F12) to activate various functions.

19 The **TrackPoint** is a built-in pointing device that functions like a mouse. It also has enhanced features that a mouse does not have.

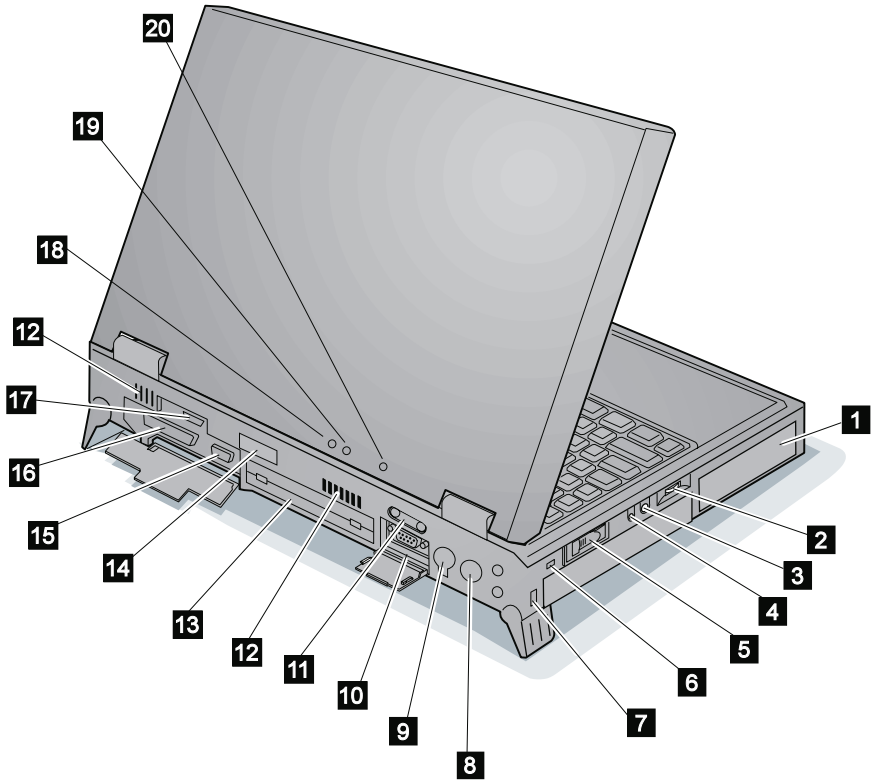
2 The **function keys** are used for activating special ThinkPad functions (shown with blue-gray icons).

21 The **built-in microphone** is used for sound recording and telephony.

22 The **indicator panel** shows the current status of the computer and battery power with indicators and numeric information.

23 The **brightness control lever** adjusts the brightness of the screen.

Rear View



1 The **battery pack** is a built-in power source for the computer. It allows you to operate the computer when ac power is not available.

2 The **volume control** adjusts the sound level of the built-in speakers.

3 The **microphone/line-in jack** is where you connect a stereo microphone or external audio
$ device. (1/8-inch stereo mini jack)

4 The **headphone jack** is where you connect a
$ stereo headphone or external speakers. (1/8-inch
$ stereo mini jack)

5 The **power switch** turns the computer on and off.

6 The **reset switch** resets the system in an emergency.

7 The **security keyhole** is used with a security lock. (See “Using Locks” on page 115.)

8 The **ac power jack** is where you connect the AC Adapter cable.

9 The **external-input-device connector** allows you to attach a mouse, an external keyboard, or an external numeric keypad.

1 The **serial connector** (9-pin) is where you connect a serial-device cable.

11 The **universal serial bus (USB) connector** allows you to connect any device that conforms to the USB interface. Many recent digital devices comply to this new standard.

12 The **fan louvers** are for circulating air within the computer. *Do not place any object in front of these louvers.*

13 The **system-expansion connector** (240-pin) allows you to connect the IBM ThinkPad SelectaBase 770 port replicator.

14 The **rear infrared port** allows your computer to communicate with other devices that have infrared data-transfer capabilities.

15 The **external-monitor connector** (15-pin) is where you attach an external monitor (CRT).

16 The **parallel connector** (25-pin) is where you usually connect a parallel-printer signal cable.

17 The **external-diskette-drive connector** is where you attach an external-diskette-drive.

18 The **power-on indicator** indicates that the computer power is on, regardless of whether the computer is in suspend mode.

19 The **suspend indicator** indicates that the computer is in suspend mode.

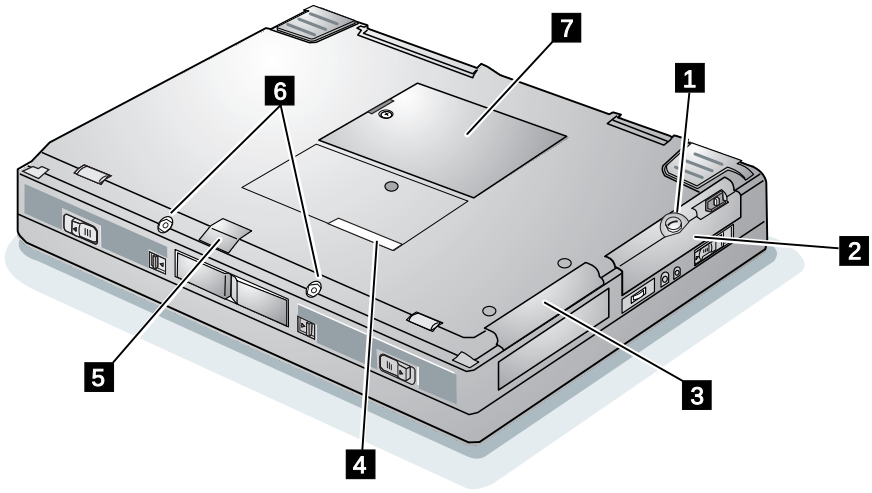
Green: The computer is in suspend mode.
Blinking green: The computer is in the process of changing modes.

2 The **charge indicator** shows the charge status of your battery.

Green: Enough battery power is left for operation.
Orange: The battery pack is being charged.
Blinking orange: The battery pack needs to be charged.

You will hear three beeps the moment this indicator starts blinking if you had set the alarm in the ThinkPad Configuration program.

Bottom View



1 The **coin screw** can be changed to a security screw shipped with your computer to prevent others from gaining access to the hard disk in the hard disk bay.

2 The **hard disk bay** houses the replaceable hard disk drive.

3 The **adapter bay** is a slot for installing the *DVD and Enhanced Video Adapter*, an optional feature of your computer.

4 The **serial number label** identifies your computer. You might be asked for this if you get support from the help center.

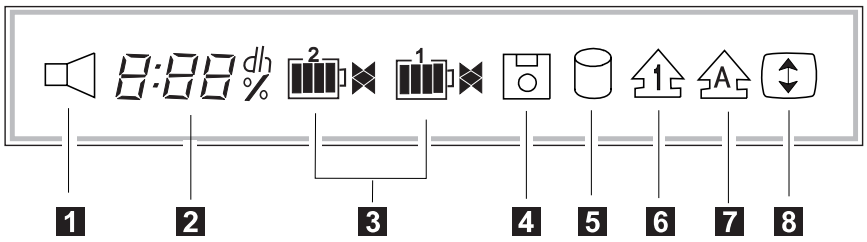
5 The **front infrared port** allows your computer to communicate with other devices that have infrared data-transfer capabilities.

6 The **security screws** are hex-head screws that can be installed to prevent others from releasing the left and right **release latches** and easily gaining access to the battery bay and the UltraBay II.

7 The **bottom compartment** houses the DIMM memory slots and the backup battery slot. You can insert up to two DIMM memory cards into the memory slots to upgrade your system memory. The backup battery in the battery slot is used for retaining computer information in computer memory and also for running the time-of-day clock.

System-Status Indicators

Various indicators appear on the indicator panel. These indicators show the current status of your computer. You can use your computer more efficiently once you know what these indicators mean.



1 The **speaker** indicator appears when the speaker beeps. It turns off when a key is pressed.

2 The **remaining battery** indicator shows the remaining battery power in either percent (*%*), days (*d*), hours (*h*), or hours and minutes (*hh:mm*).

When a secondary battery is used, the indicator shows the average percentage of the main battery and the secondary battery combined.

3 The **battery status** indicator shows the status of the main battery pack **1** (in the battery bay) and the secondary battery pack **2** (in the UltraBay II) in five levels, from empty to full .

The indicator on the right shows the battery charge status; charging (◀) and discharging (▶). A blank indicates no battery activity.

4 The **diskette drive in-use** indicator appears when data is being read from or is being written to a diskette.

Do not enter suspend mode or eject the diskette when this indicator is on.

5 The **hard disk in-use** indicator appears when data is being read from or is being written to the hard disk.

Do not enter suspend mode or turn off the computer when this indicator is on.

6 The **numeric lock** indicator indicates that the numeric keypad function is enabled. Press and hold the **Shift** key while pressing the **NumLk** key to enable or disable this function.

7 The **caps lock** indicator indicates that the caps lock mode is enabled. This mode enables you to enter the alphabetic characters (*A*–*Z*) in capital letters without using the **Shift** key. The **Caps Lock** key enables and disables this mode.

8 The **scroll lock** indicator indicates that the scroll lock function is enabled. This function enables you to use the **Arrow** keys to scroll the screen. However, you will not be able to move the cursor with these keys when this function is enabled. The **ScrLk** key enables and disables this function. Not all application programs support this function.

Functions of Your Computer

This section describes the following features:

- Keyboard functions
- ThinkPad utility programs
- The *Online User's Guide*
- UltraBay II

Keyboard Functions

Your computer's keyboard has the following functions:

- TrackPoint
- **Fn** key
- Numeric keypad

TrackPoint

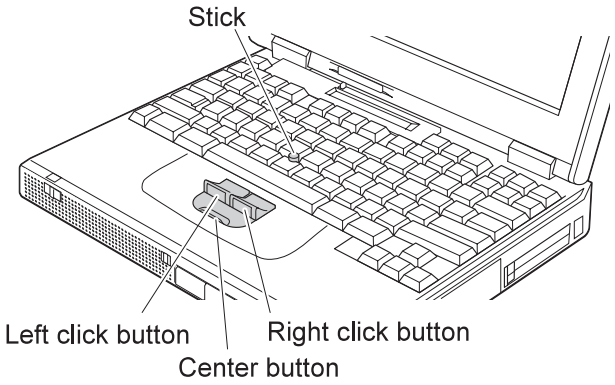
The keyboard contains a unique cursor-pointing device called the *TrackPoint*. Pointing, selecting, and dragging all become part of a single process you can perform without moving your fingers from their typing position.

You can set the following features by customizing the TrackPoint:

- Press-to-Select
- Sensitivity
- Scrolling or Magnifying Glass

For more information → “Customizing the TrackPoint” on page 49.

The TrackPoint consists of a **stick** on the keyboard and three **click buttons** below the keyboard. Movement of the cursor on the screen is controlled by the amount of pressure that you apply to the nonslip cap on the stick in any direction parallel to the keyboard; the stick itself does *not* move. The speed at which the cursor moves corresponds to the pressure you apply to the stick. The functions of the left and right click buttons correspond to those of the left and right mouse buttons on a traditional mouse; these functions depend on the software you are using. The function of the center button is described on page 52.



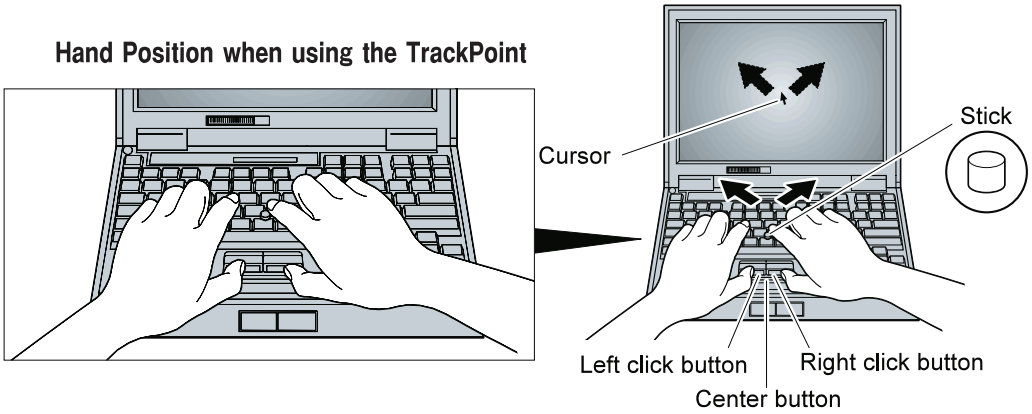
If you are not familiar with using the TrackPoint, these instructions will help you get started:

1 Place your hands in the typing position and press gently with either index finger on the stick in the direction you want the cursor to move.

Pressing the stick away from you moves the cursor up the screen; pressing it toward you moves the cursor down the screen. You can also move the cursor side to side by pressing sideways.

NOTE

The cursor might drift. This is not a defect. Do not use the TrackPoint until the cursor stops moving.

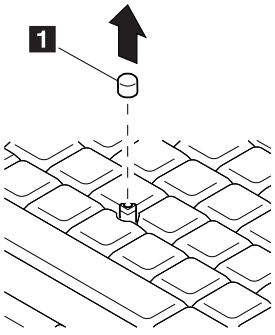


2 Press the left and right click buttons with either thumb to select and drag as required by your software.

By enabling Press-to-Select, you can make the TrackPoint stick function the same as the left or right click button. For more information → "Customizing the TrackPoint" on page 49.

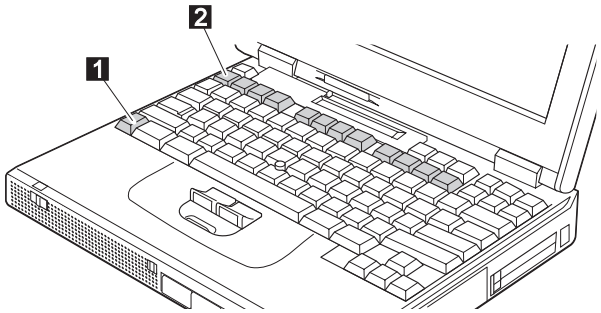
Changing the Cap

The cap 1 on the end of the TrackPoint stick is removable. You can replace it with one of the spares shipped with your computer.



Fn Key

The **Fn** key function allows you to change operational features instantly. When you use the following functions, press and hold the **Fn** key 1 ; then press the appropriate function key 2 (**F1** to **F12**).



The Fn Key Lock Function

The following setup gives you the same effect as when you press and hold the **Fn** key and then press an appropriate function key.

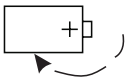
Start the ThinkPad Configuration program. (→ "ThinkPad Configuration Program" on page 26.) Click on the **Accessibility** ( ) button, and click on **Enable** for **Fn key lock**. You can also set up by typing PS2 FNS E at the command prompt.

After you enable the **Fn** key lock and press **Fn** *once*, press one of the function keys. The computer works the same as when you press **Fn** + the function key.

If you press **Fn** *twice* after enabling the lock, pressing a function key alone is recognized as a combination of **Fn** + that function key. To stop this function, press **Fn** again.

Functions of Your Computer

The following table shows the function of the **Fn** key combined with keys:

Feature and icon	Key Combination	Meaning
Power Mode Functions		
Fuel-Gauge display on or off	Fn + F2 (Only for OS/2 or Windows users)	If you press this key combination, the window for the battery status appears or disappears. You can set parameters for battery status in the window. **Note:** The Fuel-Gauge program must be activated before you can use this key combination. To activate the Fuel-Gauge program, do the following: ***1.*** Click on **Start**. ***2.*** Move the cursor to **Programs**, **ThinkPad**, and then click on **Fuel**.
Processor speed switching 	Fn + F11	The processor speed changes as follows: High Performance → Automatic → Customized → High Performance
Power Conservation Functions for Battery Power		
Standby mode	Fn + F3	The computer enters standby mode. For more information about this mode → "Basic" in the *Online User's Guide*.
Suspend mode	Fn + F4	The computer enters suspend mode. For more information about this mode → "Basic" in the *Online User's Guide*.
Hibernation mode	Fn + F12	The computer enters hibernation mode. For more information about this mode → "Basic" in the *Online User's Guide*.
Other Functions		
Switching between the LCD and the external monitor	Fn + F7	Computer output is displayed in the following order when an external monitor (CRT) is attached. CRT Display → LCD + CRT Display → LCD → CRT Display

Feature and icon	Key Combination	Meaning
Screen expansion	Fn + F8	The LCD screen image size switches between expanded and normal mode if the size of your LCD image is smaller than that of the physical LCD.

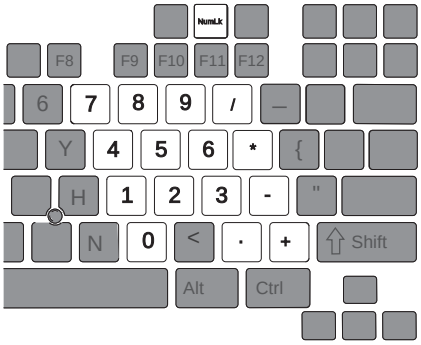
If your computer is equipped with a 13.7-inch SXGA display used in standard VGA mode, such as MS-DOS full screen mode or the safe mode screen of Windows 98 or Windows 95, computer output is displayed in expansion mode. In this case, you cannot switch the LCD screen image size.

If the computer is in suspend mode and you press the **Fn** key independently without any function key, the computer returns to normal operation.

Numeric Keypad

The keyboard has some keys that, when enabled, work as if they were a 10-key numeric keypad. (The numeric keypad on the keyboard is not active when the external keyboard or the external numeric keypad is attached to the computer.)

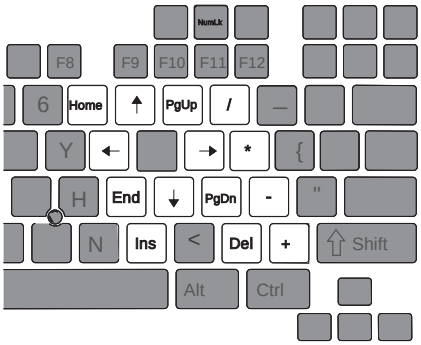
To enable or disable the numeric keypad, press and hold **Shift** and then press **NumLk**.



If the numeric keypad is enabled, press and hold **Shift** to temporarily use the cursor- and screen-control keys.

NOTE

The functions of the cursor- and screen-control keys are not printed on the keys.



ThinkPad Utility Programs

Your computer has the following utility programs for easy configuration:

Easy-Setup
ThinkPad Configuration program

This section summarizes these utility programs.

Easy-Setup

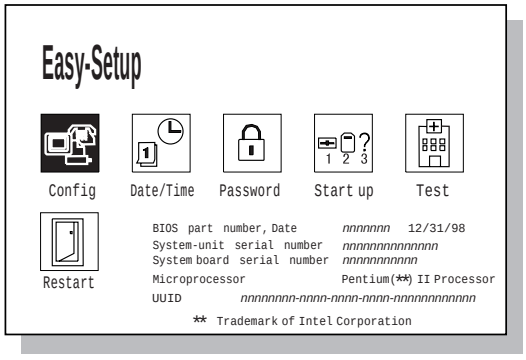
Your computer provides a user-friendly program called *Easy-Setup*, which allows you to select various setup parameters:

Config: Set the configuration of your computer.
Date/Time: Set the date and time.
Password: Set a password.
Start up: Set the startup device.
Test: Test the system.
Restart: Restart the system.

To start Easy-Setup, do as follows:

1. Power off the computer, and remove any diskette from the diskette drive.
2. Press and hold **F1**; then power on the computer. Hold **F1** until the “Easy-Setup” menu appears.

   If you have set a password, the “Easy-Setup” menu appears after you enter the password.



3 Move to an icon you want to change, using the arrow keys or the TrackPoint, and click on the icon.

A submenu is displayed.

4 Change the items you wish to change.

5 Click on **Exit** to exit from the submenu.

6 Click on **Restart** to exit from the “Easy-Setup” menu.

Your computer restarts.

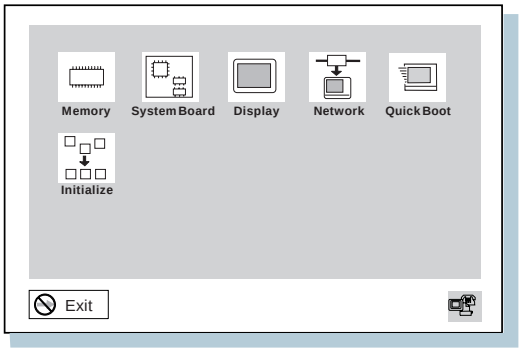
Changing the Screen Color

You can change the color of the “Easy-Setup” menu by pressing the **Ctrl**+**PgUp** keys or by pressing the **Ctrl**+**PgDn** keys.

To return to the original color, press the **Ctrl**+**Home** keys.

Config

Clicking on the **Config** button displays the following “Config” submenu:



The **Memory** button shows the amount of memory installed and available.

The **System Board** button provides information on the system board installed.

The **Display** button sets the screen output to be displayed on either a **single** screen or on **multiple** screens.

The **Network** button enables or disables the Wake-on-LAN function (option) or the Flash-over-LAN function (option). You can use these functions only with a docking station.

The **Quick Boot** button enables or disables the Simple Boot Flag function.

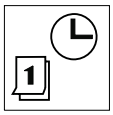
Simple Boot Flag function

This function automatically optimizes the behavior and boot performance of the BIOS and operating system, based on the installed operating system and previous boot.

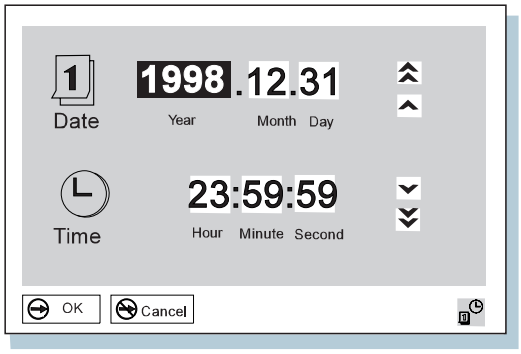
If this function is **Enabled** and once a Plug and Play–capable operating system, such as Windows 98, is installed, the system BIOS does not configure such hardware resources as system interruptions, memory windows, and I/O port ranges for all the devices in the system.

If you are going to use a non–Plug and Play–capable operating system, disable this function so that the BIOS will configure hardware resources.

The **Initialize** button sets all device settings to their default values.



Clicking on the **Date/Time** button displays the following “Date and Time” submenu, which you can use to set the current date and time:



To change the date and time, do the following:

1 Move the cursor to any field (Year, Month, Day, Hour, Minute, Second); then type the date and time.

NOTE

Instead of typing, you can place the pointer on any of the arrow icons (⏫, 🔼, 🔽, or ⏬) to adjust the date and time.

Clicking on the double-arrow icon scrolls the numbers faster.

2 Click on **OK** to save the changes or on **Cancel** to cancel them.

NOTE

You can also set the current date and time with the application included with the operating system installed in your computer.

Password

Clicking on the **Password** button displays the “Password” submenu, which you can use to set passwords:

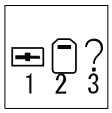
Selecting this icon displays a submenu for setting the **power-on** password.

Selecting this icon displays a submenu for setting the **hard-disk-drive (HDD)** password.

Selecting this icon displays a submenu for setting the **supervisor** password.

For more information on passwords → “Using Passwords” on page 100.

An open lock icon shows that a password has not been set yet.



Start up

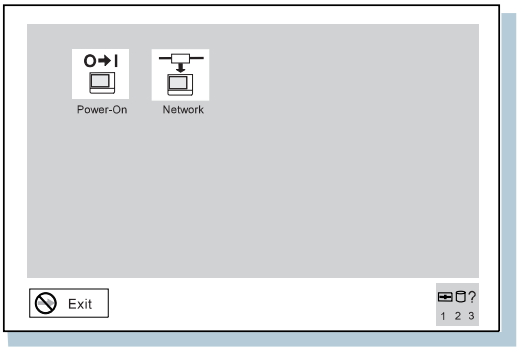
Clicking on the **Start up** button displays the “Start up” submenu, which you can use to change the startup or boot sequence.

For example, if you have different operating systems on different replaceable hard disk drives or PC Cards, you can have the system boot up from one of these devices.

To change the startup sequence, do the following:

1 Click on **Start up** in the “Easy-Setup” menu. The “Startup” submenu appears:

You must be extremely careful not to specify a wrong device during a copy, save, or a format operation after you change your startup sequence. If you specify a wrong device, your data and programs might be erased or overwritten.



Note:

The **Power-On** button sets the startup sequence when the power switch is set to ON.

The **Network** button sets the startup sequence when Wake on LAN is started. Wake on LAN is typically used by LAN administrators in corporate networks to access your computer remotely. This function can be used only with a docking station (option).

2 Click on **Power-On** or **Network**.

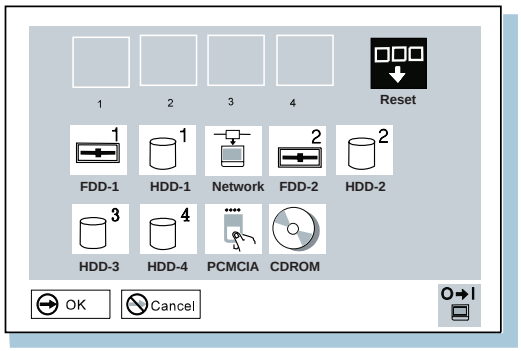
3 Move the cursor to the **Reset** icon, and click on it.

4 Select the first device you want for the startup sequence, then click on it.

You can set up to four devices.

5 Click on **OK** or press **Enter** to save the changes.

The **Power-On** submenu:



The **FDD-1** icon is the diskette drive in the UltraBay II. If you don't have a diskette drive in the UltraBay II but you have one in the docking station, that diskette drive becomes **FDD-1**. If you have an additional diskette drive, that drive becomes **FDD-2**.

The following table shows the diskette drives that correspond to FDD-1 or FDD-2:

Table 1. Supported Combinations for Diskette Drives

Case	Diskette Drive in the UltraBay II	Diskette Drive in the Docking Station	External Diskette Drive
Case 1	**FDD-1**	None	None
Case 2	None	None	**FDD-1**
Case 3	None	**FDD-1**	None
Case 4	**FDD-1**	None	**FDD-2**
Case 5	**FDD-1**	**FDD-2**	None

Note: The external diskette drive, connecting both the computer and the port replicator, and the diskette drive in the docking station use a common port. You cannot use more than two diskette drives among the three locations at the same time. You can use the diskette drive in the UltraBay II without any restriction, because the port is independent.

The **HDD-1** to **HDD-4** icons are assigned to each hard disk drive in the following priority:

1. The primary hard disk drive (placed in the hard disk bay of the computer)
2. A hard disk drive in the UltraBay II
3. A hard disk drive in the UltraBay II tray of the docking station
4. A hard disk drive in the device space of the docking station
5. A hard disk drive connected to the computer with a SCSI connector

For example, if you don't have the hard disk drive in the computer's UltraBay II but you have one in the docking station, that hard disk drive becomes **HDD-2**.

If you are using a ***remote program loading (RPL) system*** through a token-ring card or some other network card, do the following:

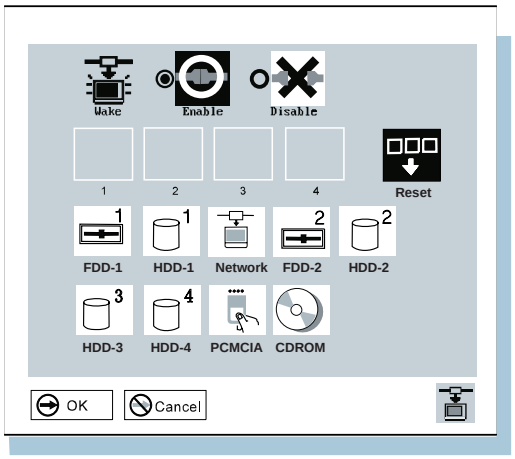
1. Select **Network** and click on it. The “Speed” menu appears.
2. If you are using a token-ring card, select the speed you want (**4** or **16**), and click on it; then press **Enter**.

   If you are using a network card other than a token-ring card, such as an Ethernet card, you need not specify the RPL speed. Press **Esc** to exit this menu.

If you select **PCMCIA**, representing, for example, ATA-3 HDD or a Flash memory card, and cannot start the system, disable the secondary IDE device and restart the system. Some cards might not be compatible with a CD-ROM or DVD-ROM drive.

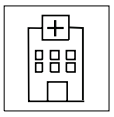
The **CDROM** icon is assigned to the CD-ROM drive in the UltraBay II. If you don't have a CD-ROM drive in the UltraBay II but you have one in the docking station, that CD-ROM drive becomes **CDROM**. If you have CD-ROM drives in both the UltraBay II and the docking station, the CD-ROM drive in the UltraBay II becomes **CDROM**.

The **Network** submenu:
(This function can be used only with a docking station option. You can enable or disable the Wake-on-LAN function.)

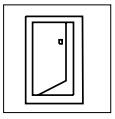


If Wake on LAN is enabled, the network administrator can power on remote machines connected in a LAN using remote network-management software. Disable the function if your computer is not under system management of a network administrator.

For more information → "System Management" in the *Online User's Guide*.


Test

Pressing the **Test** button displays the "Test" submenu. It is used to run diagnostic tests on your computer to check for hardware errors.
For more information → "Testing Your Computer" on page 164.


Restart

Pressing the **Restart** button ends the Easy-Setup program and restarts the computer.

ThinkPad Configuration Program

ATTENTION

To get specific details about ThinkPad Configuration program, click on the Help button.

The ThinkPad Configuration program allows you to set up and customize the computer's built-in devices to your needs. For example, you can enable or disable a port, switch between your computer's LCD and an external monitor, and set the power management mode.

This section describes how to start the ThinkPad Configuration program.

WIN 98

For Windows 98:
To start the ThinkPad Configuration program for Windows 98, do as follows:

1. Click on **Start** (Start).
2. Move the cursor to **Settings**; then click on **Control Panel**.

   The “Control Panel” window appears.
3. Double-click on the **ThinkPad Configuration** icon.

NOTE

You can also start the ThinkPad Configuration program as follows:

Click on **Start** (Start), move the cursor to **Programs**, and **ThinkPad**; then click on **ThinkPad Configuration**.

Find the ThinkPad icon on the bottom right of the taskbar 1 ; then double-click on the icon.

The following window appears:

1 The **Display Device** buttons. Click on one of these buttons to set the display output type to the LCD, external monitor (CRT), or both.

2 The **Power Scheme** buttons change the preset power options.

3 The **Launch Device Manager** button displays the “System Properties” window, where you can make a device available or unavailable.

4 The **Show Allocated Resources View** button displays the “Allocated Resources View” window, where you can check the memory addresses and other allocation settings.

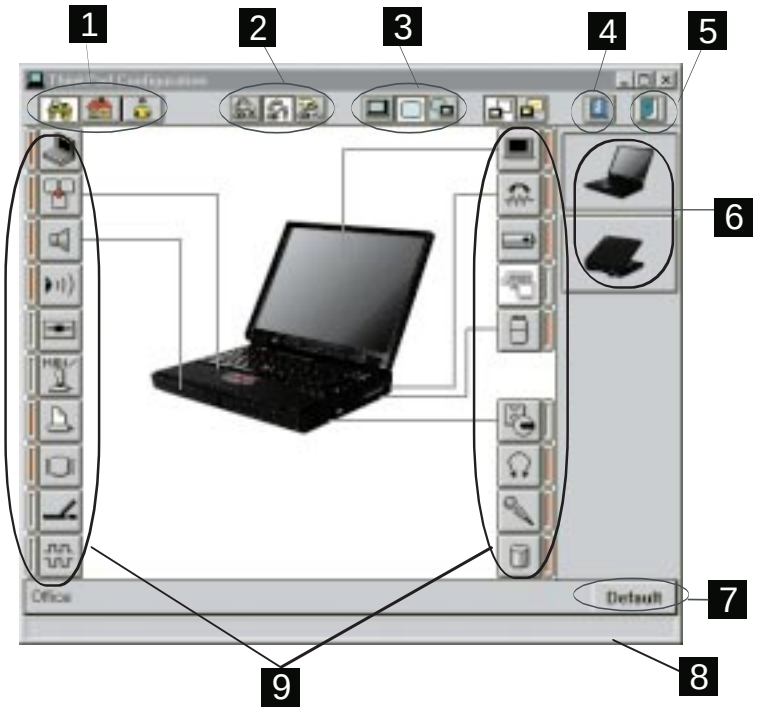
5 The **Help** button displays online help.

6 The **Device** buttons. Click on the button of your choice from the window. If the device is enabled, the red indicator next to the button is lit. Otherwise, it stays off.

For Windows NT:
To start the ThinkPad Configuration program for Windows NT, do as follows:

1. Click on **Start** at the bottom corner of the screen.
2. Move the cursor on **Programs**, **ThinkPad**; then click on **ThinkPad Configuration**.

The following window appears:



1 The **One-Touch Setup** buttons. Click on one of these buttons to set the system configuration.

2 The **Power Mode** buttons. Click on one of these buttons to set the power mode to High Performance mode, Automatic mode, or Customized mode.

3 The **Display Device** buttons. Click on one of these buttons to set the display output type to the LCD, external monitor (CRT), or both. When making a presentation, you can click on the presentation button to disable any system timers, such as the LCD turnoff timer or the power management mode timers.

4 The **Help** button displays online help.

5 The **Exit** button. Click on this button to save the changes made and to exit from the ThinkPad Configuration window.

6 The **View Angle** buttons. Click on the front view or rear view button to display the hardware feature locations.

7 The **Default** button. Click on this button to set the default values for each option and to cancel the changes you just made.

8 The **Status** bar. The device name and its status appears in the status bar when you place the cursor on a device button.

9 The **Device** buttons. Click on the button of your choice from the window; then set the options for that device from the window that appears. If the device is enabled, the red indicator next to the button is lit. Otherwise, it stays off.

Only the top portion of the window is displayed when you click on the triangular minimize button in the top-right corner.

Online User's Guide

Your computer features an *Online User's Guide*, so that you will always have key information at your fingertips even if you are traveling. It contains the following information:

Basic:
- Using your computer outside your country
- Using audio and modem features
- Using your computer with a PC Card
- Using your computer with a battery pack
- Protecting your computer
- Frequently asked questions

Advanced:
- Resolving system resource conflicts
- Installing software
- Using system management
- Using PS2 commands

Information:
- Getting service
- Handling tips
- Glossary

To start the *Online User's Guide*, click on **Start**, move the cursor to **Programs** and **ThinkPad 770**; then click on **ThinkPad 770 User's Guide**.

The *Online User's Guide* appears. Go to the section you want, and make a printout if necessary.

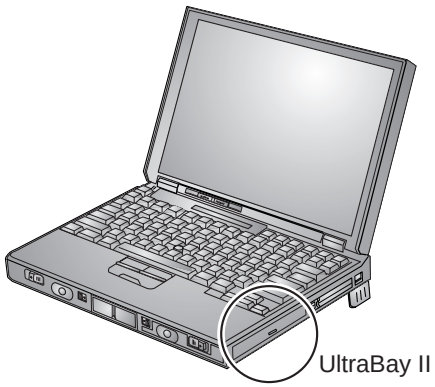
You can start the *Online User's Guide* from the ThinkPad Customization CD as follows:

1. From the ThinkPad Customization Center main menu, click on **Online Library**.
2. Click on **Click here to launch the Online User's Guide**.

You can also access the *Online User's Guide* from the IBM Web site.

UltraBay II

Your ThinkPad 770X computer has an UltraBay II.



You can install one of the following devices in the UltraBay II:

- CD-ROM drive
- Diskette drive
- DVD-ROM drive
- Secondary hard disk drive (requires a secondary HDD adapter)
- Secondary battery pack (requires a battery adapter)

For how to replace the UltraBay II device → “Replacing an UltraBay II Device” on page 90.

Backing Up Your System

To back up your system or reinstall the operating system, your ThinkPad computer has the following features:

The ThinkPad Customization CD
The Recovery CD
The Diskette Factory program
ConfigSafe
The ThinkPad Web site or bulletin board

Using the ThinkPad Customization CD

The ThinkPad Customization CD is provided for your installation convenience; you can customize your system using this CD. It contains all the software applications and hardware device drivers for your computer. It also contains device drivers and installation instructions for other operating systems, such as Windows NT.

If you need to reinstall a software application or a hardware device driver, put the ThinkPad Customization CD in your CD-ROM drive or DVD-ROM drive. The menu of the features appears automatically.

The ThinkPad Customization CD is compatible with Internet Explorer Version 4.0 or later. Some functions are available in other Web browsers. See the instructions printed on the CD label for more information.

The following features are included:

Getting Started
Use this page for first-time setup, such as registration and ThinkPad personalization.

System Customization
Use this page for doing the following:

- Reinstalling a software application for Windows 98
- Reinstalling a hardware device driver for Windows 98
- Installing all hardware device drivers when installing Windows 95
- Installing all hardware device drivers when installing Windows NT

News and Updates
This page has all of the latest tools and links to the IBM Web site for system information, service and support information, and other information.

Online Library
In case you do not have the *Online User's Guide* on your hard disk drive, you always have a copy on your ThinkPad Customization CD.

Using the ThinkPad Customization CD
This page contains an overview of ThinkPad Customization CD.

Using the Recovery CD

If you accidentally erase your hard disk, you can use the Recovery CD to restore the contents of the preinstalled hard disk to what it was at the time of purchase.

This recovery program deletes all personal data and your customized configuration settings. It resets your computer to most of the factory-shipped default values. Be sure to back up your personal files before you use this CD.

The Recovery CD package consists of a startable diskette and a CD-ROM containing the original preinstalled image.

The recovery process might take up to 2 hours.

If you have a CD-ROM drive or DVD-ROM drive installed in your computer's UltraBay II and you don't have an external diskette drive attached, go to “Case 1” on page 34.

If you have a CD-ROM drive or DVD-ROM drive installed in your computer's UltraBay II and you do have an external diskette drive attached, go to “Case 2” on page 35.

If you have a diskette drive installed in your computer's UltraBay II, replace it with the CD-ROM drive or DVD-ROM drive (see “Replacing an UltraBay II Device” on page 90). Then go to “Case 1” on page 34.

Case 1: Your computer supports startable CDs when the startable CD function is enabled. To use the Recovery CD, enable this function; then recover the system:

1. Power off the computer.
2. Insert the Recovery CD into the CD-ROM drive or DVD-ROM drive.
3. Power on your computer while pressing and holding the **F1** key.

   Hold the **F1** key until the Easy-Setup window appears.
4. Click on **Start up**.
5. Click on **Power-on**.

   Note the current setting of the startup sequence so that you can set it again after you finish the recovery (in step 18).
6. Click on **Reset**.
7. Click on **CDROM**.
8. Click on **OK**.
9. Click on **Exit**.

   The startable CD-ROM function is enabled.
10. Click on **Restart** and then **OK**.

    The computer restarts.
11. Follow the instructions on the screen.
12. When a completion message appears, remove the Recovery CD from the CD-ROM drive or DVD-ROM drive.
13. Power off the computer.

14 Power on your computer while pressing and holding the **F1** key.

Hold the **F1** key until the Easy-Setup window appears.

15 Click on **Start up**.

16 Click on **Power-on**.

17 Click on **Reset**.

18 Specify the startup sequence that you noted in step 5, and click on **OK**.

19 Click on **Exit**.

20 Click on **Restart** and then **OK**.

Your computer restarts with the preinstalled configuration.

Case 2

1 Power off the computer.

2 Insert the Recovery CD Boot Diskette in the diskette drive.

3 Power on your computer.

4 Insert the Recovery CD into the CD-ROM or DVD-ROM drive.

5 Follow the instructions on the screen.

The recovery program on the boot diskette includes drivers to support many devices such as the external CD-ROM drive, docking station, and hard disk drive. Choose an appropriate option. You are prompted if user intervention is required.

6 When a completion message appears, remove the Recovery CD Boot diskette from the diskette drive.

7 Press **Restart**.

Your computer restarts with the preinstalled configuration.

Using the Diskette Factory

The Diskette Factory program contains all the hardware device drivers for your computer in the Windows 95, Windows 98, and Windows NT environment.

For the device drivers for Windows 3.1, OS/2, and DOS → **http://www.ibm.com/thinkpad**

To recover a particular device driver or utility program, create the backup diskettes for it with the Diskette Factory; then reinstall it. To create the backup diskettes, do the following:

1 Click on **Start**.

2 Move the cursor to **Programs** and **ThinkPad 770**; then click on **Diskette Factory**.

3 Click on the tab at the top corresponding to the operating system you are using.

4 Click on the diskette group for the backup copy that you want to make.

1. You can select more than one group by clicking while pressing **Ctrl**.
2. The number of the diskettes required is shown beside the diskette group. You do not need to use a blank diskette; the Diskette Factory prompts you to reformat diskettes that are not blank.

5 Click on **Build**.

6 Follow the instructions on the screen.

For details on how to install software, including a new operating system and device drivers → “Advanced” in the *Online User's Guide*.

Using ConfigSafe

ConfigSafe is an application program for Windows 98, Windows 95, or Windows NT that periodically takes *snapshots* of your system files. If your computer does not operate properly after you install a new device driver or software, use ConfigSafe to restore the last working version of your system files. Although it might not make your new hardware or software work, it will set your computer up and running again. This application protects your data.

Using the ThinkPad Web Site or Bulletin Board

IBM supplies all of the latest hardware device drivers and system BIOS for your computer on the ThinkPad Web site:
http://www.ibm.com/thinkpad

You can also use the IBM bulletin board service.

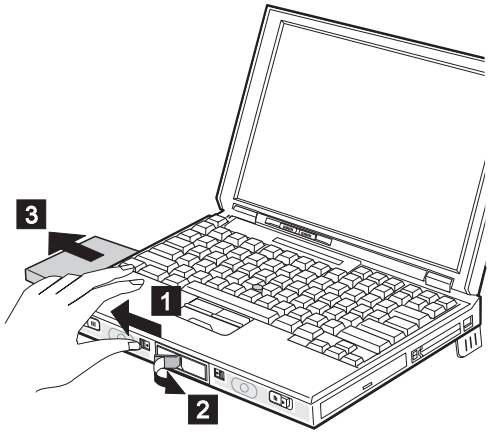
For more information about electronic service and support
Online User's Guide.

Replacing the Battery Pack

To replace the battery pack, do as follows:

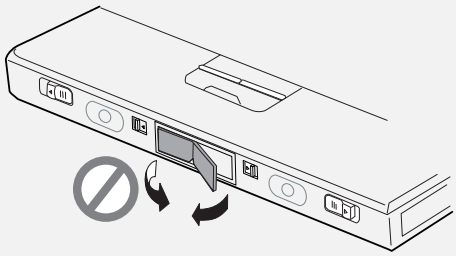
1 Power off your computer; then disconnect the AC Adapter and all cables from the computer.

2 Slide the left release latch to the left 1 and gently lift up the bay eject lever 2 and pull out the battery pack 3 .



NOTE

You can use only one eject lever at a time. When opening an eject lever, make sure that the other eject lever is closed.



3 Insert the new battery pack until it snaps into place.

Make sure you **align the slanted edge** of the battery pack with the slant on the battery bay.

4 Push in the bay eject lever until it is flush.

You have finished replacing the battery pack.

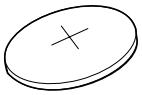
You can replace the battery when the computer is in hibernation mode or when it is powered off. If you are using a PC Card, the computer might not be able to enter hibernation mode. If this happens, power off the computer.

To switch from the main battery to the secondary battery

→ "Installing the Secondary Battery Pack" on page 95.

Replacing the Backup Battery

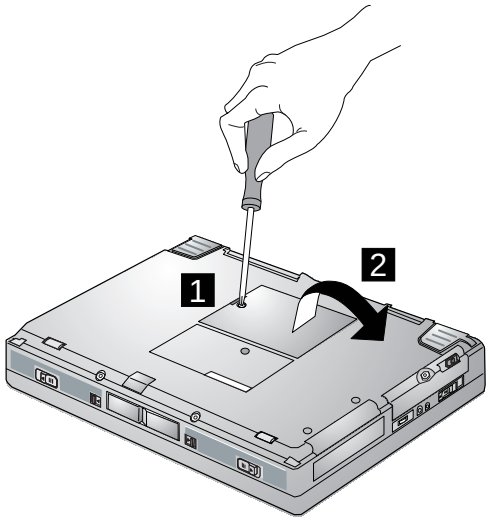
This section explains how to replace the backup 3-volts lithium battery (CR2025) in the bottom compartment.



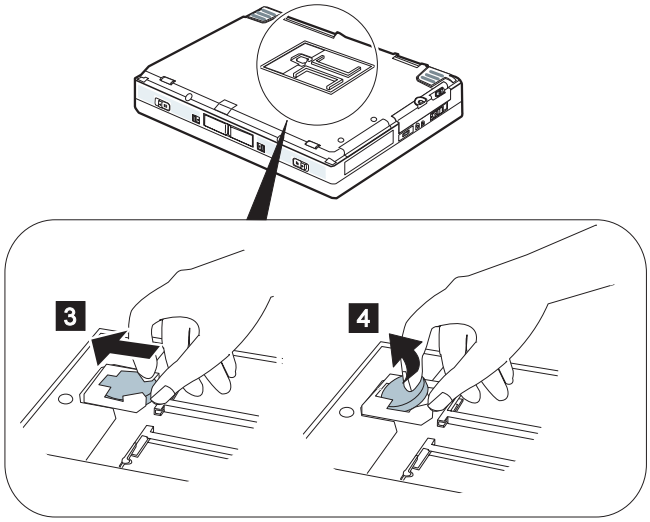
1 Power off the computer; then disconnect the AC Adapter and all cables from the computer.

2 Turn the computer over.

3 Open the bottom compartment with a screwdriver 1 and remove the bottom cover 2 .



4 Find the old backup battery in the bottom compartment and remove it from the battery holder by pushing it in 3 ; then the one side of the battery pops up 4 .



NOTE

Remove the battery after it pops up from the battery holder. Forcing the battery out will damage the holder.

$
$

5 Install a new backup battery facing up the side on which plus mark (+) is shown.

6 Replace the bottom cover, and turn the computer over again.

7 Connect the AC Adapter to the computer.

You have finished replacing the backup battery.

Getting Service

Purchasing an IBM PC hardware product entitles you to receive support and services during the limited warranty period. If you need additional support and services, a wide variety of extended solutions that addresses most needs are available for purchase.

About Your Warranty

During the warranty period, you might be responsible for repair costs if the product damage was due to misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance.

For full information on product warranties, see Appendix B.

You will need to know the following information when requesting repair service:

Identification number of your computer
Options installed in your system

Note: Use the record sheet on page 44.

Error message or problem

Note: Error messages can help identify which service action is required and help the service representative provide quick and efficient service.

Use the record sheet on page 45.

Help at the ThinkPad Web Site

You can get support and information at the ThinkPad Web site.

The latest information about the ThinkPad computers

→ **http://www.ibm.com/thinkpad**

Technical support information

→ **http://www.pc.ibm.com/support**

IBM may make improvements or changes to these Web sites at any time without any notice.

Help by Telephone

You can get support and information by telephone during the limited warranty period at no additional charge, through the IBM PC Help Center. Experienced technical-support representatives will be on hand to assist you in answering any questions you might have, such as:

- How to set up your computer
- How to install and set up your IBM options purchased directly from IBM or through an IBM reseller
- How to use the 30-day support for the preinstalled operating system
- How to get service
- How to get overnight shipment of customer-replaceable parts

Please have the following information ready when you call:

- Serial number of your computer and proof of purchase
- Description of the problem
- Exact wording of the error message
- Hardware and software configuration information for your system

If possible, be at your computer when you call:

In the U.S. and Puerto Rico, call 1-800-772-2227.
In Canada, call 1-800-565-3344.

These lines are available 24 hours a day, 7 days a week. The answering technical-support representative can also fax or mail you technical or product information, such as:

- Product brochures
- Location of IBM resellers
- Services available from IBM

For more information → *Online User's Guide*

Recording Sheet

Option List

Fill out the following list with the items which correspond with the features of your computer. If you have two or more devices, note each of them. For example, if you have two DIMMs, put the check mark to the **DIMM** check box; then note “128 MB x 2.”

DIMM _____MB

Hard Disk Drive _____MB

External Diskette Drive

DVD/CD-ROM Drive

PC Cards

_____

_____

Battery Pack

Identification Numbers

The serial number label is on the bottom of your computer. Write down the machine **Type** and the serial number (**S/N**) in the following box:

IBM Product Name	ThinkPad 770X
Machine Type	9549- _____
Serial Number	_____

To determine your computer's serial number → page 6.

Problem Recording Sheet

Computer information:

Machine type:_____

Serial number:_____

Date of purchase:___/___/___

Type of problem:

Continuous problem Intermittent problem

Error code:

_____

The operating system and its version number, if available:

Windows 98 Version_____
Windows 95 Version_____
Windows NT Version_____
Windows 3.1 Version_____
OS/2 Version_____
DOS Version_____

Application programs running at the time of the problem:

_____

_____

Problem symptom:

Describe the problem specifically:

_____

_____

_____

Can the problem be reproduced?

Yes No

If yes, describe how it can be reproduced:

_____

_____

Getting Service

Chapter 2 Extending the Features of Your Computer

This chapter provides information about how to customize and extend the ThinkPad features. You can use your computer with external devices and increase its memory.

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Customizing the TrackPoint

You can customize the TrackPoint by doing the following:

1. Open the ThinkPad Configuration program.
2. Click on the **TrackPoint** button ( ).
3. Click on **TrackPoint Properties...**.

   The “TrackPoint Properties” window appears:

   You can set the following features in this window:

   Press-to-Select
   Sensitivity
   Scrolling or Magnifying Glass

Setting Press-to-Select

If you enable Press-to-Select by putting a check mark in the **Enable Press-to-Select** box, you can make the TrackPoint stick function the same as the left or right click button.

If you check **Enable dragging**, you can drag the icon that you select with the TrackPoint stick by putting light pressure on the stick.

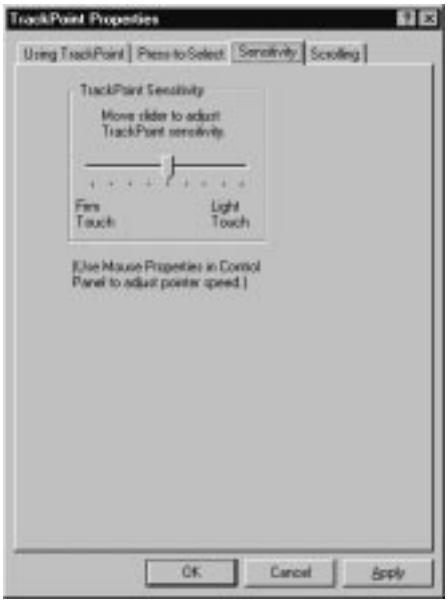
If you check **Enable Release-to-Select**, you can click simply by lifting your finger quickly off the TrackPoint. Moving the cursor onto an icon and then lifting your finger off the TrackPoint works like clicking. Pressing the TrackPoint again works like double-clicking.

Click on one of the **Press means** radio buttons to select which button the stick will simulate: either the left or the right button. For example, if you select **Left Click**, you can start a program with the TrackPoint by putting the cursor on the program's icon and applying light pressure on the stick.

To adjust the pressing timing of the stick, set **Click Pace**.

If you set the pace too slow, you might notice unintended clicks, a cursor delay, or a dragging delay. However, if you set the pace too fast, you might find Press-to-Select hard to use.

Setting Sensitivity



This function adjusts the force required for both cursor movement and Press-to-Select. Slide toward **Firm Touch** to increase the force needed to move the cursor and to activate Press-to-Select. Slide toward **Light Touch** to decrease the force needed to move the cursor and to activate Press-to-Select.

Setting Scrolling or Magnifying Glass

By clicking on the **Scrolling** tab, you can set the scrolling properties of your TrackPoint.

Choose Scrolling or the Magnifying Glass Function
Select one of the following radio buttons:

- **Scrolling**
  This function enables you to navigate easily through long documents or large spreadsheets with the press of a button. To scroll, press the center click button and then use the TrackPoint instead of the scroll bars.
- **Magnifying Glass**
  This function enables you to enlarge a movable area of your display. You can click on objects “through” the magnifying glass. The right click button changes the size of the magnifying glass, and the left click button changes its magnifying power. You can press the center click button and then use the TrackPoint to move the magnified area.

– **Neither**
  This function disables the scrolling and magnifying glass functions.

Choose Scrolling Method
Select one of the following radio buttons:

– **Press Center Button, then use TrackPoint**
  This option enables you to hold down the center click button and then use the TrackPoint to control the scrolling or the magnifying glass. When you are not holding down the center button, the TrackPoint operates normally; that is, it controls the mouse cursor.

– **Use External Mouse**
  This option sets an externally attached mouse to scroll (or move the magnifying glass) horizontally or vertically. The TrackPoint functions simply as a cursor.

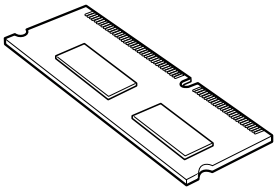
– **Use TrackPoint**
  This option sets the TrackPoint to scroll horizontally or vertically without your holding down the center button. Use an externally attached mouse as a cursor.

  You can still use the TrackPoint to control the mouse cursor by pressing the center button.

The **Use External Mouse** and the **Use TrackPoint** radio buttons are enabled only if a mouse is attached.

Increasing Memory

Increasing memory capacity is an effective way to make programs run faster. You can increase the amount of memory in your computer by installing a *dual inline memory module (DIMM)*, available as an option.



Different capacities of DIMMs are available. You can install a DIMM directly in one of the memory slots on the bottom of the computer. Your computer memory capacity can be expanded up to 320 MB (64-MB base memory and two 128-MB DIMM options). If your computer is equipped with 128-MB base memory, install two 128-MB DIMM options after removing the 64-MB DIMM option that had been installed at the time of purchase.

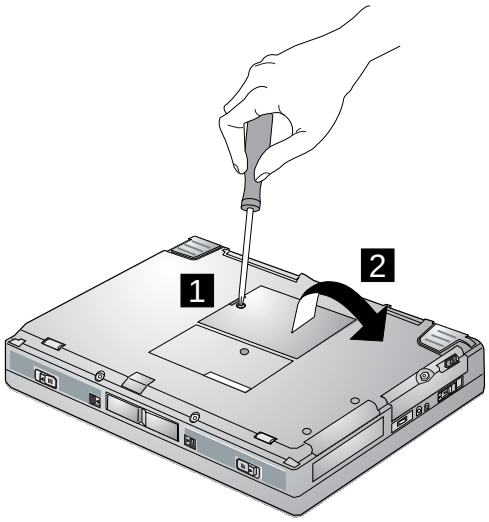
The ThinkPad 770X computer supports the synchronus dynamic random access memory (SDRAM) card only. It does not support the enhanced data output dynamic random access memory (EDO DRAM) card. If you install a DIMM that is not supported by your computer, a 225 error code might appear when the system starts. The appropriate memory option can be purchased through your IBM reseller or IBM marketing representative.

Installing the DIMM

To install the DIMM, do the following:

1. Power off the computer; then disconnect the AC Adapter and all cables from the computer.
2. Remove the battery pack.
3. Close the LCD, and turn the computer over.
4. Loosen the screw on the memory slot cover 1 ; then remove the cover 2 .

To avoid damaging the DIMM, do not touch its contact edge.

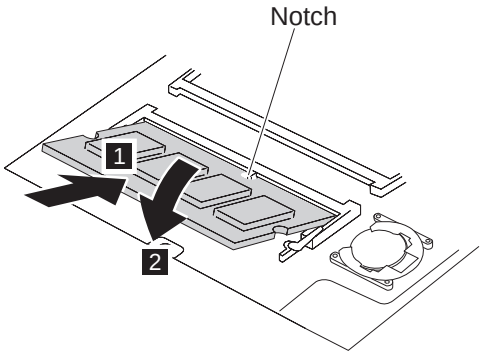


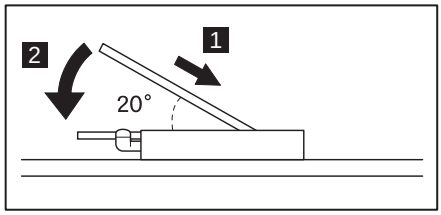
5. Find the notch on the side of the DIMM.

6 With the notched end of the DIMM toward the right side of the socket, insert the DIMM, at an angle of approximately 20°, into the socket; then press it firmly 1 .

7 Pivot the DIMM until it snaps into place 2 .

If you want to install two DIMMs, repeat steps 5 through 7.





8 Replace the memory slot cover over the memory slot, aligning the back side of the cover first as shown; then tighten the screw.

9 Turn the computer over again.

10 Replace the battery pack and power on the computer.

11 Confirm that the new memory size appears at the upper left corner of the screen.

For example, if you install a 32-MB DIMM to 64-MB base memory model into your computer, you should see the following. (See the next page for how to calculate the total memory size.)

```
97728 KB OK
```

You have finished installing the DIMM. Reconnect all cables.

1. For the following status, power off the computer and reinstall the DIMM and do the memory test with Easy-Setup (see “Testing Your Computer” on page 164).

   If a 2 1 error code appears under the memory count.

   ```
   48576 KB OK
   2 1
   ```

   If the total memory size is not the same as the value you calculated.

   If the 225 error code appears, the memory you are installing is not supported by your computer.

2. If you changed the memory installed in the computer, you need to create a new hibernation file as follows:

   a) Power off the computer.
   b) Remove the DIMM you added.
   c) Power on the computer and disable hibernation mode.
   d) Add the DIMM.
   e) Enable hibernation mode.

   To disable and enable hibernation mode → “Basic” in the *Online User's Guide*.

How to Calculate Total Memory Size

Calculate your total memory size in kilobytes (KB) by adding the DIMM memory size to the base memory size (32192 KB).

For example, if you installed a 32-MB DIMM into your computer with 64-MB base memory, you should have about 96 MB.

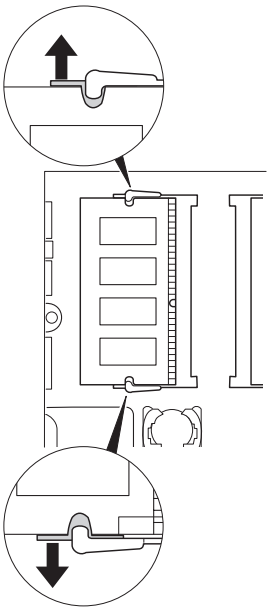
Your computer might display memory size in kilobytes. For example, 96 MB=97728 KB.

Note: 576 KB is reserved by the system.

Removing the DIMM

1. Power off the computer and disconnect the AC Adapter and all cables from the computer.
2. Remove the battery pack.
3. Close the LCD, and turn the computer over.
4. Loosen the screw and remove the memory slot cover.

5 Press out on the latches on both edges of the socket at the same time.



6 Remove the DIMM.

Be sure to save the DIMM for future use.

7 Replace the memory slot cover; then tighten the screw.

8 Turn the computer over again.

9 Replace the battery pack; then connect the AC Adapter and all the cables you disconnected.

Upgrading the Hard Disk Drive

You can increase the storage capacity of your computer by replacing the original, built-in hard disk drive with an optional one. You can purchase the option from your IBM reseller or IBM marketing representative.

Replace the hard disk drive only if you upgrade it or have it repaired. **You should not replace it often.**

Handling a Hard Disk Drive

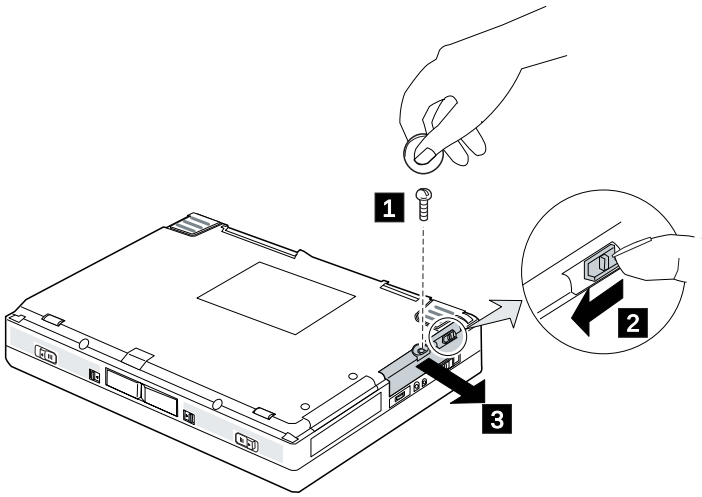
Do not drop or apply any shock.
Do not apply pressure to the cover.
Do not touch the connector.

The drive is very sensitive. Incorrect handling can cause damage and permanent loss of data on the hard disk. Before removing the hard disk drive, make a backup copy of all the information on the hard disk. Never remove the drive while the system is operating, in suspend mode, or in hibernation mode.

To replace the hard disk drive, do the following:

1. Power off the computer; then disconnect the AC Adapter and all cables from the computer.
2. Remove the battery pack (→ “Replacing the Battery Pack” on page 38), and turn the computer over.

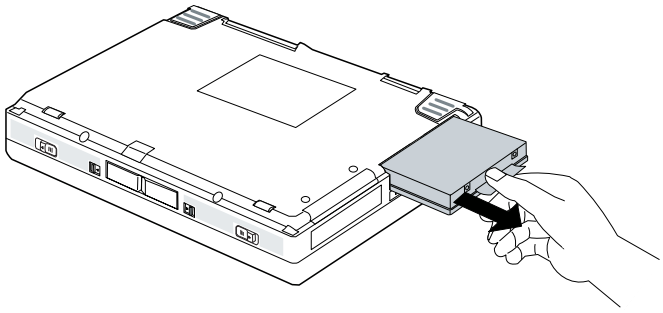
3 Remove the coin screw by rotating it counterclockwise with a coin, as shown 1 , slide the latch 2 ; then remove the hard disk drive cover 3 .



NOTE

You can replace the coin screw with the security screw shipped with your computer. With the security screw installed, the hard disk drive in your computer cannot be removed easily. To remove or tighten the security screw, use a 2.5-mm allen wrench.

4 Pull the strap of the hard disk drive to remove it.



5 Insert the new hard disk drive into the bay. Make sure you connect the drive firmly.

Do not use force when inserting the hard disk drive into the bay. The connector is sensitive, and it might get damaged.

6 Replace the hard disk drive cover; then reinstall the screw, and turn the computer over again.

7 Replace the battery pack, and power it on.

After removing the original hard disk drive, store it in the carrying case that contained the replacement drive.

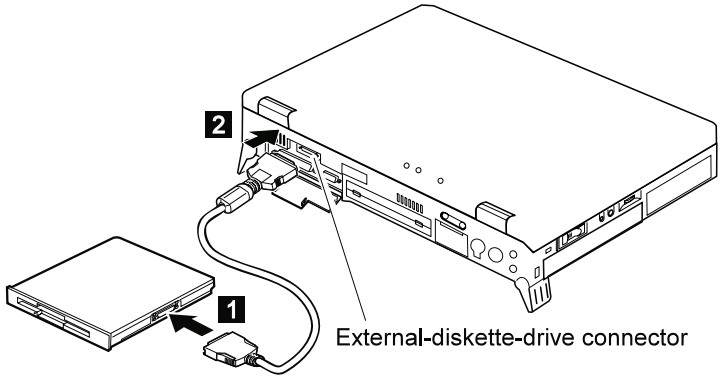
Attaching the External Diskette Drive

You can connect your external diskette drive to the external-diskette-drive connector. To attach it, do as follows:

1 Power off your computer.

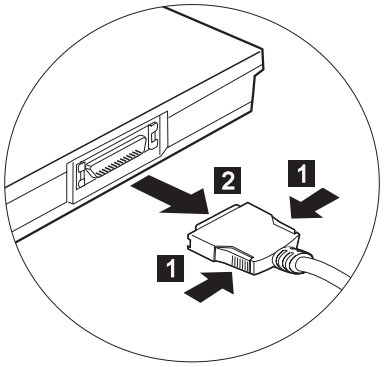
2 Open the connector cover on the rear side of the computer.

3 Attach the cable first to the external diskette drive 1 ; then attach it to the external-diskette-drive connector on the computer 2 .



Attaching the External Diskette Drive

To detach the external diskette drive, push the connector lock on both sides 1 ; then disconnect the cable from the connector 2 .



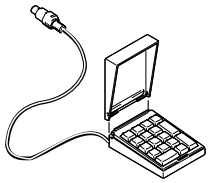
Attaching an External Mouse, Keypad, and Keyboard

This section explains how to attach an external mouse, external numeric keypad, and external keyboard to your computer.

Attaching an External Mouse or Numeric Keypad

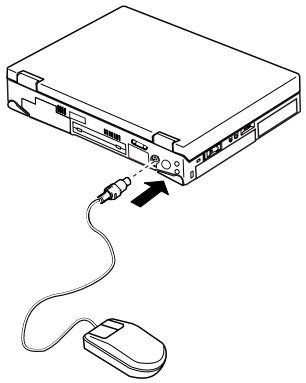
You can attach an external mouse or numeric keypad to the external-input-device connector ( ) on the rear of the computer.

Mouse



Numeric Keypad

If you want to attach the mouse, attach it directly to the external-input-device connector as shown:

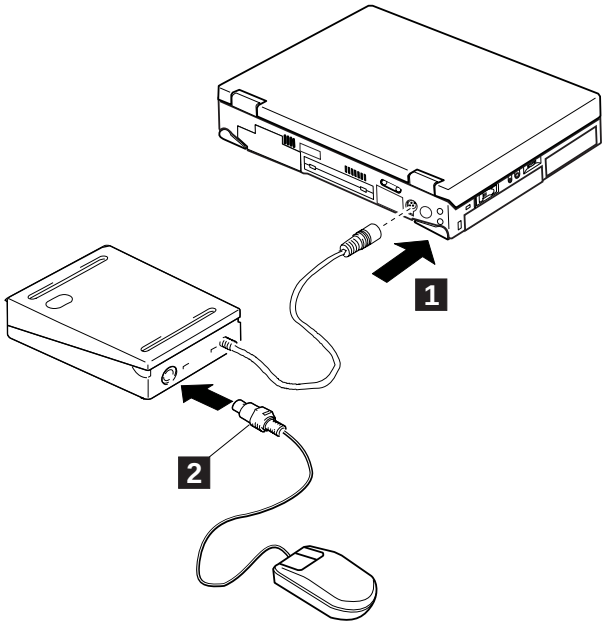


Attaching External Mouse, Keypad, and Keyboard

ATTENTION

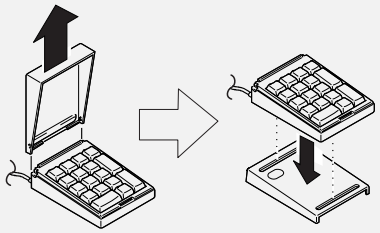
You can use both the IBM PS/2 Miniature Mouse and the TrackPoint as an input device. To connect a mouse other than an IBM PS/2 Miniature Mouse
→ "Disabling the TrackPoint" on page 69.

If you want to use both the external numeric keypad and mouse at the same time, first connect the keypad cable to the computer 1 ; then connect the mouse cable 2 to the connector at the rear of the keypad.



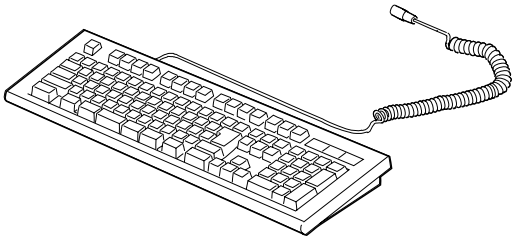
NOTE

You can remove the keypad cover and use it as a stand for the keypad.



Attaching an External Keyboard and Mouse

Mouse



External Keyboard

If you want to attach an external keyboard to your computer, do the one of the following:

Use the optional keyboard/mouse cable.
Use an optional port replicator.

The external keyboard will not work if it is connected directly to the computer's external-input-device connector.

See the *Options by IBM Catalog* supplied with your computer for details about the options.

When the external keyboard is attached, the following keys are not available:

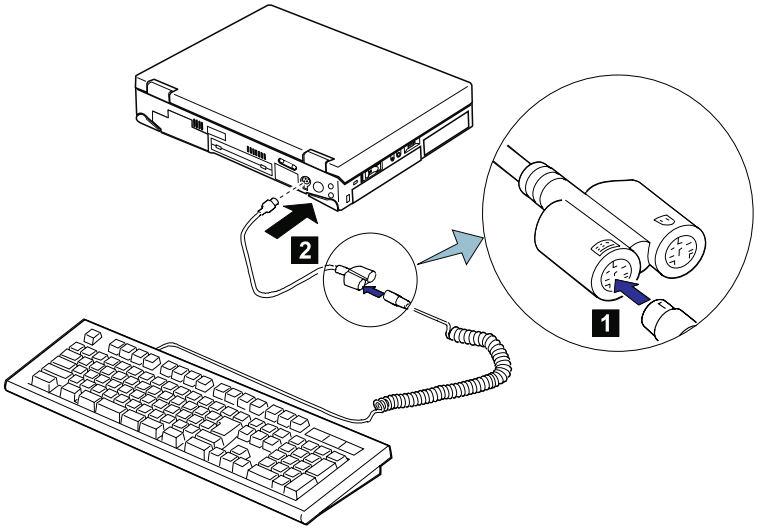
Numeric keypad on the computer keyboard
External numeric keypad

Instead, use the numeric keypad on the external keyboard.

Attaching External Mouse, Keypad, and Keyboard

To attach the external keyboard, power off the computer, attach the keyboard to the keyboard connector of the keyboard/mouse cable 1 , and then attach the keyboard/mouse cable to the computer 2 .

You can attach a mouse to the mouse connector of the keyboard/mouse cable.



Using the IBM ThinkPad Space Saver Keyboard

If you are using the IBM ThinkPad Space Saver Keyboard, ***do not*** install the device driver supplied with the keyboard. The device driver on the computer's utility diskette automatically enables or disables the TrackPoint when the power to the computer is turned on.

Disabling the TrackPoint

The TrackPoint is designed to work simultaneously with another pointing device (such as a mouse) attached to the system. But some mouse types require the TrackPoint to be disabled before you can use them, such as:

A mouse that is not fully compatible with the PS/2 mouse connected to the external-input-device connector

A mouse connected to the serial connector

A mouse connected to the USB connector

To disable the TrackPoint:

1. Start the ThinkPad Configuration program.

   See “ThinkPad Configuration Program” on page 26.

2. Click on the **TrackPoint** ( ) button.

3. Click on **Auto-Disable** for the TrackPoint.

   This setting automatically disables the TrackPoint if a mouse is connected to the external-input-device connector when the computer starts. If no external mouse is connected, however, the TrackPoint is enabled. Therefore, to reenable the TrackPoint if it has been disabled, restart the computer after disconnecting a mouse.

If you use a mouse connected to the serial connector or the USB connector, you need to select **Disable**, instead of **Auto-Disable**.

Attaching an External Monitor

This section provides information about using the computer LCD and an external monitor (CRT). It also provides considerations when using DOS applications.

The LCD of your computer uses thin-film transistor (*TFT*) technology. The LCD displays output with XGA (1024x768) or SXGA (1280x1024) resolution video mode and 16M colors.

If you are attaching an external monitor (CRT) that supports a resolution higher than VGA mode, you can achieve a maximum of 1600x1200 video resolution.

To attach an external monitor, do the following:

1. Power off the computer.
2. Connect the external monitor to the external-monitor connector () at the rear of the computer; then connect the monitor to an electrical outlet.
3. Power on the monitor and the computer.
4. Start the ThinkPad Configuration program.

   See “ThinkPad Configuration Program” on page 26.
5. Change the display output location by clicking on the **Both LCD and CRT Display** ( ) button or the **CRT Display Only** ( ) button (with Windows 98, at the *top left* of the screen; with Windows NT, a little to the *right of the top center* of the screen).

Do not change the display output location when your computer id doing any of the following:

- Playing or recording audio
- Playing a movie
- Playing a game
- Running any other multimedia application

Stop these applications before changing the display output location.

If you are attaching an external monitor that does not support TFT resolution with TFT frame rate, do ***not*** click on **Both LCD and CRT Display**. Doing so would cause the external monitor screen to be scrambled and output also not to be displayed; in addition, the screen might become damaged. Use **CRT Display Only** instead.

You can also change the display output location by pressing **Fn**+**F7**.

6 Set your monitor type and display device driver as follows.

For more information → “Resolutions, Color Depths, and Frame Rates” on page 72.

a) Click on the **Start**.

b) Move the cursor to **Settings** and **Control Panel**; and then click on **Control Panel**.

c) Double-click on **Display**.

d) Select the **Settings** tab.

e) Click on the **Advanced...** button.

f) Click on the **Monitor** tab.

g) Click on the **Change...** button.

The “Update Device Driver Wizard” window appears. Follow the instructions on the screen to select your monitor type from the monitor list, and click on a new resolution, color depth and refresh rate.

7 Restart the computer to make the changes effective.

Do not disconnect the external monitor while the computer is in suspend mode or hibernation mode. If no external monitor is attached when the computer resumes, the LCD remains blank and output is not displayed. This restriction does not depend on the resolution value.

Resolutions, Color Depths, and Frame Rates: The following tables show the resolutions, color depths, and frame rates available with your computer or external monitor. Use these tables to set the display output (**LCD Only**, **CRT Display Only**, or **Both LCD and CRT Display**).

When installing an operating system, you must install the display driver supplied with the computer to use SVGA or higher mode.

Displaying output on the LCD, or on both the LCD and the external monitor (**LCD Only** or **Both LCD and CRT Display**).

Resolution	Supported Color Depth
640x480 (VGA)	256, 64K, and 16M*
800x600 (SVGA)	256, 64K, and 16M*
1024x768 (XGA)	256, 64K, and 16M*
1280x1024 (SXGA support model only)	256, and 64K
Note: Video overlay, capture, and MPEG playback functions do not work under the video modes which are marked by the asterisk (*).	

Displaying output only on the external monitor (**CRT Display Only**)

Resolution	Supported Color Depth	Frame Rate
640x480 (VGA)	256, 64K, and 16M	60 Hz, 72 Hz, 75 Hz, and 85 Hz
800x600 (SVGA)	256, 64K, and 16M	60 Hz, 75 Hz, and 85 Hz
1024x768 (XGA)	256, 64K, and 16M*	60 Hz, 70 Hz, 75 Hz, 85 Hz, and 87iHz
1280x1024 (SXGA)	256, and 64K	60 Hz, 75 Hz, 85 Hz*, and 87iHz
1600x1200	256, and 64K	96iHz*
Note: Video overlay, capture, and MPEG playback functions do not work under the video modes which are marked by the asterisk (*).		

If you are using an old external monitor, the resolution and refresh rate might be limited.

Using the Dual Display Function

Windows 98 supports a function named *Multiple Display Support* and your computer supports a function called *Dual Display* in the Windows 98 environment. This function allows the Windows 98 desktop to display output on the LCD-CRT display pair or (if your computer has a video-out connector) LCD-TV display pair. You can display the different desktop images on each monitor.

Attaching a television to your computer:
To attach a television (NTSC or PAL), you need to install a DVD and Enhanced Video Adapter (option) to your computer. For more information → IBM option manual.

To enable the dual display, do as follows:

If you attach the computer to a television, follow the instructions to enable it before doing the following → "Enabling the Multi-Display Function on a Television" on page 75.

1. Attach an external monitor (CRT) to your computer.
2. Click on **Start**.
3. Move the cursor to **Settings** and **Control Panel**; and then click on **Control Panel**.
4. Double-click on **Display**.
5. Select the **Settings** tab.
6. Click on the **Monitor-2** icon in the window.

   The "Monitor #2" window appears.
7. Click on **Yes** to enable the monitor-2.

You can select the color depths and resolutions for each monitors.

8. Click on the **Monitor-1** icon (for the secondary display, the CRT or TV).

9. Select the color depth and the resolution of the secondary display.
10. Click on the **Monitor-2** icon (for the primary display, the LCD).
11. Select the color depth and resolution of the primary display.
12. Set the relative position of the each monitor by dragging its icon.

You can set the monitors in any relative position, but the icons must touch each other.

13. Click on **OK** to apply the changes.

Enabling the Multi-Display Function on a Television

1. Attach a television (NTSC or PAL) to the video-out connector of your computer.
2. Click on **Start**.
3. Move the cursor to **Settings** and **Control Panel**; and then click on **Control Panel**.
4. Double-click on **Display**.
5. Select the **Settings** tab.
6. Double-click on the **Monitor-1** icon in the window.
7. Click on the **Display Device** tab.
8. Select either NTSC or PAL from the “TV Standard” field.
9. Click on the **LCD+TV** button.
10. Click on **OK** to apply changes.

11 Click on **OK** to close the window.

After you enable the multi-display function on a television, follow the instructions for enabling the dual display function on page 74.

How to Disabling the Dual Display

1 Click on **Start**

2 Move the cursor to **Settings** and **Control Panel**; and then click on **Control Panel**.

3 Double-click on **Display**.

4 Select the **Settings** tab.

5 Click on the **Monitor-2** icon.

6 Remove the check mark from the **Extend my Windows desktop onto this monitor** check box.

The secondary monitor (monitor-2) is disabled, and the settings are in the ready-to-use condition.

Considerations

The primary display is either a CRT or a television and the secondary display is the LCD of your computer.

You cannot set dual display if you specify the LCD to a 1280x1024 resolution and 16M colors for color depth.

The followings are the settings that you are *not* supported:.

LCD	CRT or TV
1024x768, 16M	1280x1024,256 or 64K Any resolution, 16M
1280x1024, 256	1024x768, 16K
1280x1024, 16M	1280x1024, 64K Any resolution, 16M

You need to enable the television setting every time you start your computer to use this function with the television.

If you want to show DOS full screen, only primary CRT or TV becomes DOS full screen modes, secondary (LCD) becomes blank.

If you play the video clip (AVI or MPEG file) on the CRT or TV, the image is in overlay mode. On the other hand, on the LCD, the playback will be a software drawing.

An application using the DirectDraw or the Direct3D is shown only on the primary display (LCD) when it is played with full screen mode.

You cannot use the **Fn+F7** (display switching) function and **Fn+F8** (screen expansion) when you are in the dual display mode.

DVD movie cannot be played back if you use the dual display function. To playback it, disable the function before playing back a DVD movie.

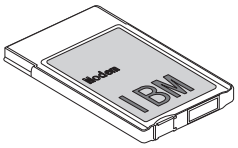
Disable the dual display function before you disconnect a CRT or a television.

The followings are the settings that you are *not* supported when doing overlay playback:

LCD	**CRT or TV**
1024x768, 256	1024x768, 16M
1024x768, 65K	1024x768, 16M 1280x1024, 64K
1024x768, 16M	800x600, 64K 1024x768, 256 or 64K
1280x1024, 256	1280x1024, 256 or 64K
1280x1024, 64K	1024x768, 64K 1280x1024,256

Installing a PC Card

This section describes how to install a PC Card.



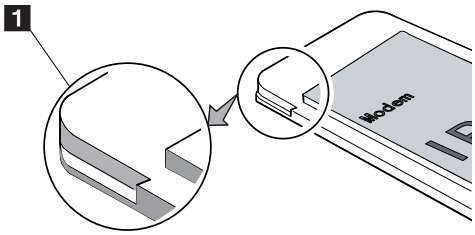
ATTENTION

Do not insert a PC Card while the computer is in suspend mode or hibernation mode. Otherwise, the system might hang.

Your computer has two PC Card slots (upper slot and lower slot) and supports the following types of cards:

PC Card (Type I, Type II, and Type III)
CardBus Card
Zoomed Video (ZV)

1 Find the notched edge 1 of the PC Card as shown.

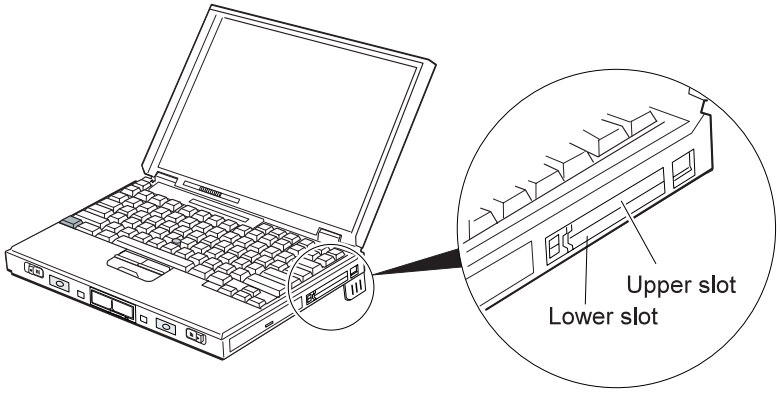


2 Insert the PC Card into the appropriate slot according to your PC Card type.

NOTE

If you are using a Type I or Type II PC Card, insert it into either the upper slot or the lower slot.

If you are using a Type III PC Card, insert the card into the lower slot.



3 Press the PC Card firmly into the connector.

For Windows 98:
If you have not installed the PC Card driver, Windows 98 starts to install it.

For Windows NT:
Your computer has PC Card support software called CardWizard. You can use the PC Card as soon as you insert the card into the computer. The “SystemSoft CardWizard” window appears and informs you about the new card.

You have completed setting up the PC Card, and you can now use it. For information on how to use the PC Card software → “Basic” in the *Online User's Guide*.

Removing the PC Card

ATTENTION

Do not remove a PC Card while the computer is in suspend mode or hibernation mode. Otherwise, the system might hang when resuming.

Before removing storage PC Cards, such as the hard disk PC Card, Flash memory PC Card, or SRAM PC Card, from the PC Card slot, ***you must stop*** the PC Card. Otherwise, data on the PC Card might be corrupted or lost.

1 Stop the card.

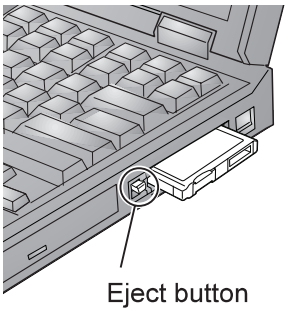
To stop the PC Card → "Basic" in the *Online User's Guide*.

NOTE

The **Stop** option appears in gray when you are in CardSoft mode or when the card is already stopped.

2 Press the PC Card eject button to pop out the button. Then press it again until the PC Card pops out.

3 Remove the PC Card and store it safely for future use.



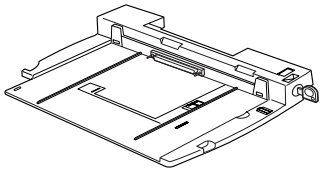
For more information for using a PC Card → "Basic" in the *Online User's Guide*.

Using a Docking Station

You can extend the capabilities of your computer by attaching it first to the SelectaBase 770 port replicator and a docking station.

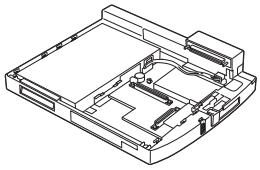
NOTE

The port replicator, available as an option, is a convenient way to attach several input devices and an external monitor. Of course, you can also attach these devices directly to your computer.

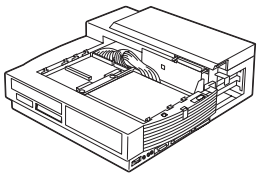


SelectaBase 770
(Port Replicator)

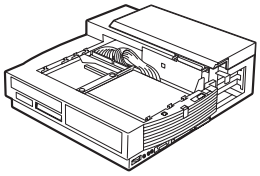
Then you can attach (dock) the computer–port replicator –combination to one of the following docking stations:



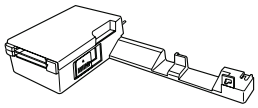
SelectaDock I



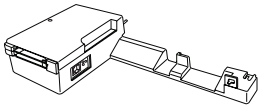
SelectaDock II



SelectaDock III



PC Card Enabler



PC Card Enabler with Advanced EtherJet Feature

You can dock your computer to a docking station under the following conditions:

With your computer powered off (*cold docking*)
With your computer in suspend mode (*warm docking*)
With your computer operating (*hot docking*)

Depending on the hardware configuration or the operating system, warm docking or hot docking might not be supported. Refer to the user's guide shipped with these docking stations or a port replicator for instructions on how to dock your computer to a docking station.

You might not be able to read the status indicator or access the UltraBay II easily on the SelectaDock I docking station after you dock it with the SelectaBase 770 port replicator.

In the Windows 95, Windows NT, Windows 3.1, or DOS environment, you need to install the PC Card support software *after* docking your computer to the docking station. If you have already installed the PC Card support software, uninstall it and then reinstall it after you dock your computer to the docking station.

Docking with Your Computer Powered Off (Cold Docking)

You should dock with both your computer and your docking station powered off if:

It is the first time you are docking your computer to the docking station.

Or:

You have changed the device configuration of your docking station, such as when you have installed or removed a device.

Cold docking resets the docking station's device status recorded on your computer. Thereafter, you can dock your computer with the docking station at any time.

To dock the computer for the first time, do the following:

1 Install new devices in the docking station.

$ ***2*** Connect the AC Adapter.

$ If you use a SelectaDock I or SelectaDock II docking station,
$ connect the AC Adapter to both a docking station and a
$ SelectaBase 770 port replicator.

$ If you use a SelectaDock III docking station, connect the AC
$ Adapter to a docking station.

$ $ $ If you use a PC Card Enabler or PC Card Enabler with Advanced EtherJet Feature, connect the AC Adapter to the SelectaBase 770 port replicator.

3 Dock your computer to the docking station.

See the user's guide shipped with the docking station for how to dock your computer to it. If you use the SelectaDock I, SelectaDock II, or SelectaDock III docking station, the docked status ◯ appears on the docking station status indicator, showing that the computer is properly docked.

4 Power on the computer.

Windows 98 or Windows 95 begins to check the status of the docking station and restarts a couple of times. Follow the instructions that appear on the screen.

During this operation, Windows 98 or Windows 95 creates a configuration profile for the docking station with the name *Dock X*.

X can be any number from 1 to 3.

The message “Version Conflict” might appear on the screen. Answer **Yes** to the prompt “Do you want to keep this file?”

5 In Windows 98 or Windows 95, select **My Computer**, **Control Panel**, **System**, and then the **Hardware Profile** tab.

6 Make sure the new profile, Dock *X*, is created. Also, select the **Device Manager** tab and make sure that the new devices are displayed in the device list.

If Dock *X* is not created, repeat from step 1.

If the symbol “**!**” or “**x**” appears next to the device symbol, a resource conflict might have occurred. Resolve the problem by referring to "Resolving System Resource Conflicts" in the *Online User's Guide*.

After the new hardware profile Dock *X* is created, you can dock or undock your computer to the docking station while power is on.

Undocking When Your Computer Is Powered On or in Suspend Mode (Hot or Warm Undocking)

NOTE

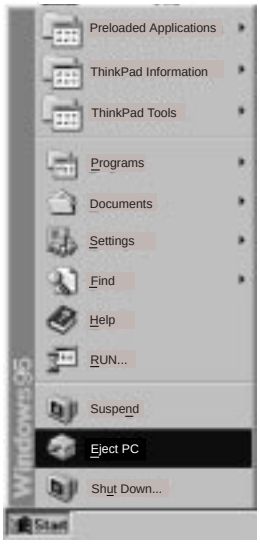
If your computer does not enter suspend mode while it is docked in the docking station, do the following:

1. Start the ThinkPad Configuration program.
2. Click on the **Power Management** ( ) button.
3. Click on the **Suspend/Resume Options** tab.
4. Put a check mark in the **Suspend/hibernate while docked** check box by clicking on it.

Your computer can now enter suspend mode while docked.

To undock your computer from the docking station when the computer is operating (*hot undocking*) or when the computer is in suspend mode (*warm undocking*), do the following:

1 Select **Start** in Windows 98 or Windows 95, and then **Eject PC**. The LCD screen on your computer powers off and on.



Or:

Turn the security key of the docking station to the eject position and release the key.

An eject request is made to the operating system. It might take some time for this eject operation to end.

To see if the eject operation is complete, click on **Start** again and see if the **Eject PC** icon still appears. If the icon still appears, wait until it disappears.

2 When you hear a beep, turn the security key to the rear again. Now you can eject your computer from the docking station.

If the operating system rejects the eject request, a message appears on the screen. If this happens, try *cold undocking*.

Presetting a Device to Avoid a Resource Conflict

The Windows 98 or Windows 95 plug-and-play function enables you to use devices that you install in the docking station immediately after you power on your system. If you cannot use them, a system resource conflict might have occurred. Do the following to resolve the conflict:

For a PCI adapter or an internal SCSI device:

1 Start the ThinkPad Configuration program and click on the **Docking Station** ( ) button.

2 Assign at least one IRQ value. The default setting is IRQ 9.

For an ISA adapter card:

1 Open Windows 98 or Windows 95 Device Manager and check the resources available for the new card.

2 Disconnect the AC Adapter from the SelectaBase 770 port replicator.

3 Set the jumper or the DIP switches on the adapter card.

For an IDE device such as a hard disk drive or a CD-ROM drive:

NOTE

Before you do the following steps, read “Enabling the IDE Drive on the Docking Station”

1 Start the ThinkPad Configuration program and click on the **Docking Station** ( ) button.

2 Click on the **IDE Device** tab.

3 Select **Enable** in the **UltraBay II IDE device in the Docking Station** list box (if you haven't already), and restart the computer.

4 Click on **Device Manager** and check whether there is a resource conflict between the new IDE device and the other devices in the computer. If there is a resource conflict, see the *Online User's Guide*.

Enabling the IDE Drive on the Docking Station

If you have installed an IDE device (such as a hard disk drive or a CD-ROM drive) in the docking station, you must change the setting on your computer to enable the device. By default, your computer uses the primary IDE channel for the primary hard disk drive (Primary-Master) and the secondary IDE channel for a device in the UltraBay II (Secondary-Master). You cannot use the IDE device in the docking station in this default **2-channel default IDE mode**.

To enable an IDE device in the docking station, you must change the default setting to either of the following:

3-channel IDE mode. In this mode, you can still use the hot and warm swap functions for a device in the UltraBay II. An additional IRQ for the third IDE channel is required.

2-channel IDE mode. In this mode, you do not have to assign an extra IRQ. However, you cannot use hot and warm swap functions for a device in the UltraBay II.

If you change the IDE channel configuration, the drive letter assignment might be changed.

Setting to 3-Channel IDE Mode

1. Open the **ThinkPad Configuration** program.
2. Click on the **Docking Station** ( ) button.

   The “Docking station” window appears.
3. Click on the **Device Manager...** button.

   The “System Properties” window appears.
4. Click on **Computer**; then click on the **Properties** button.
5. Determine an available IRQ value other than IRQ 11 or 15 (IRQ 9 is recommended) by checking the current setting under the **View Resources** tab. If there is no available IRQ value, remove a device that is not currently being used by clicking on the device and the **Remove** button under the **Device Manager** tab.
6. Click on **OK** to close the “System Properties” window.
7. Return to the “Docking station” window; then click on the **IRQ Holder for PCI Steering** tab.
8. Change the IRQ value in **1st IRQ** to the available value you determined in step 5.
9. Click on the **IDE Device** tab.
10. Select **Enable** in the **UltraBay II IDE device in the docking station** list box.
11. Select **Third** in the **IDE Channel** list box.
12. Click on **OK** to close the “Docking station” window.

13 Restart the system by clicking on **OK** in the warning dialog box.

Setting to 2-Channel IDE Mode

1 Open the **ThinkPad Configuration** program.

2 Click on the **Docking Station** ( ) button.

The “Docking station” window appears.

3 Click on the **Device Manager...** button.

The “System Properties” window appears.

4 Click on **Computer**; then click on the **Properties** button.

5 Determine an available IRQ value other than IRQ 11 by checking the current setting under the **View Resources** tab. If there is no available IRQ value, remove a device that is not currently being used by clicking on the device and the **Remove** button under the **Device Manager** tab.

6 Click on **OK** to close the “System Properties” window.

7 Return to the “Docking station” window; then click on the **IRQ Holder for PCI Steering** tab.

8 Change the IRQ value in **1st IRQ** to the available value you determined in step 5.

9 Click on the **IDE Device** tab.

10 Select **Enable** in the **UltraBay II IDE device in the docking station** list box.

The third IDE is automatically selected.

11 Select **Second** in the **IDE Channel** list box.

12 Click on the **Disable Devices** button in the warning dialog box.

13 Click on **OK** to close the dialog box.

14 Restart the system by clicking on **OK** in the warning dialog box.

The following table shows the relationship between the devices and IRQ values:

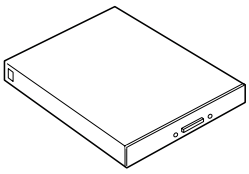
Device	2-Channel IDE Default Mode	3-Channel IDE Mode	2-Channel IDE Mode
Hard disk drive	IRQ 14, P-M	IRQ 14, P-M	IRQ 14, P-M
UltraBay II	IRQ 15, S-M	IRQ 15, S-M	IRQ 14, P-S
Docking station	Disabled	IRQ 11, T-M and T-S	IRQ 15, S-M and S-S

Legend:

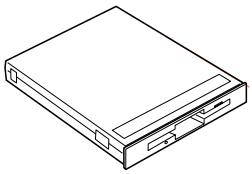
1. P-M: Primary-master
2. P-S: Primary-slave
3. S-M: Secondary-master
4. S-S: Secondary-slave
5. T-M: Third-master
6. T-S: Third-slave

Replacing an UltraBay II Device

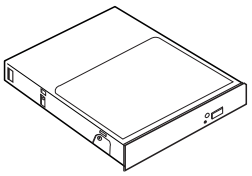
You can install one of the following devices in the UltraBay II:



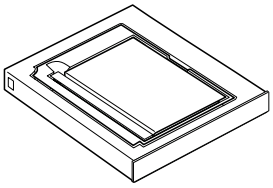
CD-ROM Drive



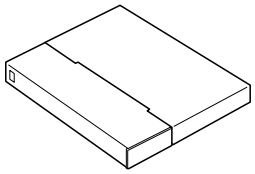
Diskette Drive



DVD-ROM Drive



Secondary Hard Disk Drive
(requires a secondary HDD adapter)



Secondary Battery Pack
(requires a battery adapter)

Hot and Warm Swap Functions

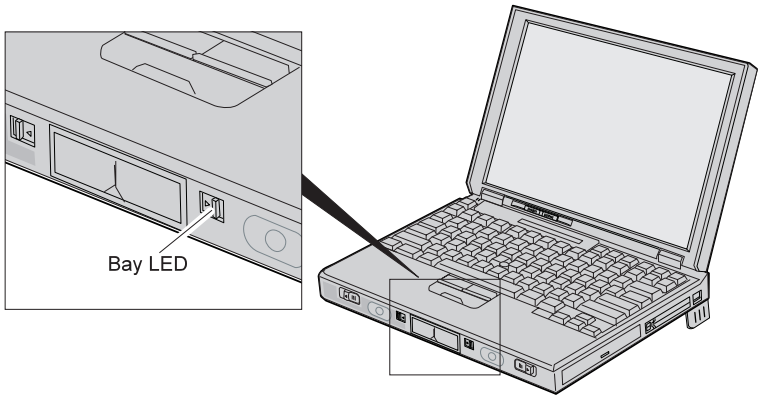
Your computer enables you to attach or detach devices dynamically (*hot* or *warm swap*) in the UltraBay II.

Hot swap means to replace a device with your computer powered on.

Warm swap means to replace a device while your computer is in suspend mode.

Cold swap means to replace a device while the computer is powered off. Your computer supports cold swap for all devices.

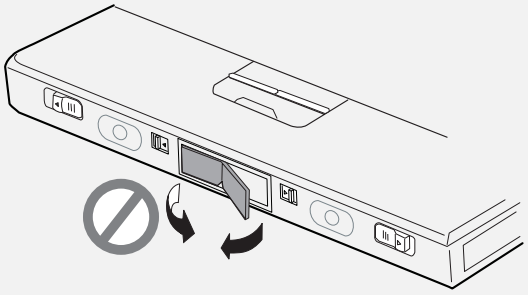
Your computer has a bay LED that indicates when you can safely remove a device from the UltraBay II.



NOTE

If you hot-swap a device during communication using the build-in modem or PC Card modem, communication might stop. Hot-swap the device only after finishing communication.

You can use only one eject lever at a time. When opening an eject lever, make sure that the other eject lever is closed.



Replacing an UltraBay II Device

Color	Action	Sound
Green	You can remove a device from or install a device in the UltraBay II.	No beep
Blinking green	Removal or installation is in process.	No beep
Black (off)	A device is operating normally in the UltraBay II, or there is no device is in the UltraBay II.	No beep
Blinking orange	A device (such as a hard disk drive) is about to be removed, but the *hot* and *warm* swap function is not supported. Do not remove the device. Push back the bay eject lever. A device (such as a hard disk drive) is about to be installed, but the *hot* and *warm* swap function is not supported. Do not install the device. Push back the bay eject lever, and power off your computer; then install the device.	A short beep followed by a continuous beep
Orange	A device that was not supposed to be removed (such as a hard disk drive) was removed. The computer might be damaged.	A long beep

If you want to swap the device in the UltraBay II, release the bay eject levers; a message appears. Make sure the bay LED stays green and there is no beep; then swap the device. If the bay LED is blinking orange, do not attempt to swap the device.

For Windows 98 or Windows 95
The hard disk drive does not support the hot and warm swap functions.

For Windows NT
The hard disk drive does not support the hot and warm swap functions. In addition, the CD-ROM drive does not support the hot swap function.

Hot or warm swap of an IDE device (CD-ROM drive or DVD-ROM drive) is not supported in 2-channel IDE mode.

Removing and Replacing Devices

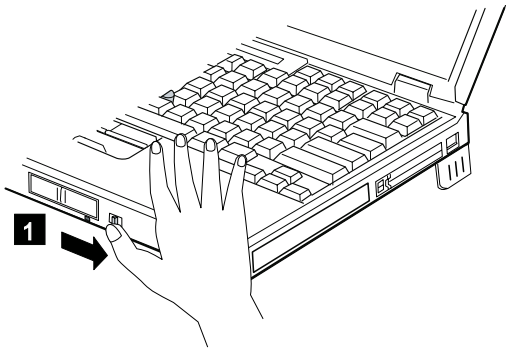
To remove a device from the UltraBay II, do the following:

1 If the device is a CD-ROM drive or DVD-ROM drive, remove any CD-ROM or DVD-ROM from it.

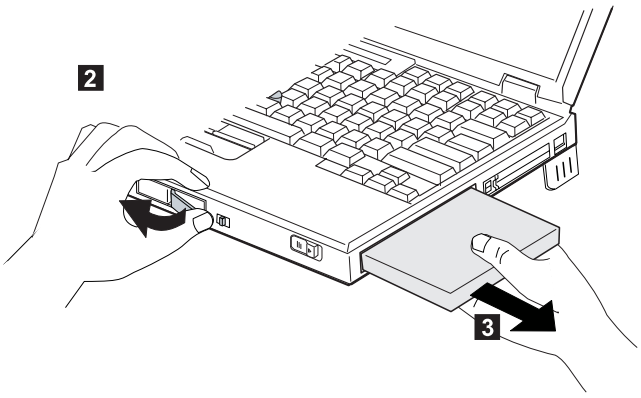
If the device is a diskette drive, remove any diskette from it.

2 Power off the computer; then disconnect the AC Adapter and all cables from the computer.

3 Slide the right release latch to the right 1 .



4 Gently lift up the bay eject lever 2 and remove the device from the bay 3 .



5 Install another device into the UltraBay II by referring to the manuals shipped with the option.

Make sure you **align the slanted edge** of the device with the slant on the UltraBay II.

NOTE

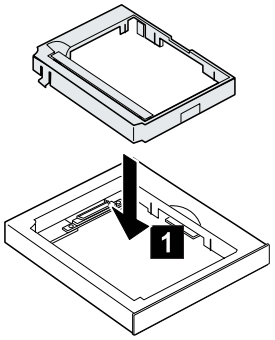
You can install the screws shipped with your computer to prevent others from gaining access to the device. For more information

→ "Using the Security Screw" on page 116.

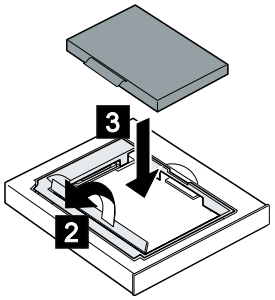
Installing a Secondary Hard Disk Drive

To install a secondary hard disk drive into the UltraBay II, do the following:

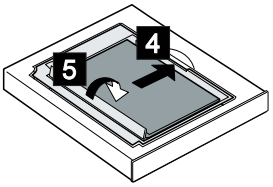
1 Attach the adapter component to the adapter 1 .



2 Open the disk stopper 2 , and install the hard disk drive into the adapter 3 .



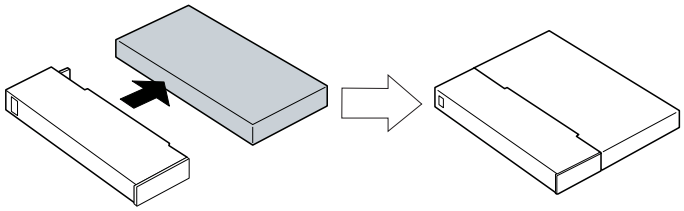
3 Slide the hard disk drive to the right 4 and close the stopper 5 .



4 Install the adapter into the UltraBay II.

Installing the Secondary Battery Pack

Before installing a secondary battery pack into the UltraBay II, attach the battery pack to the adapter case; then insert it into the UltraBay II.



If switching from the main battery to the secondary battery:

1. Insert the battery pack with the secondary battery into the UltraBay II.
2. Make sure that the bay eject lever is locked.
3. Wait until the discharge symbol (▶) moves from the main battery (**1**) to the secondary battery (**2**) icon in the indicator panel.

   You can now remove the main battery from the battery bay.

If changing or removing the secondary battery:

1. Unlock the UltraBay II.
2. Wait until the discharge symbol (▶) moves from the secondary battery (**2**) to the main battery (**1**) icon. It takes a few seconds.

   You can now remove the secondary battery.

   If the symbol does not move, the main battery (**1**) is not charged and you cannot remove the secondary battery.

Device Restrictions

Restrictions on some of the devices include the following:

Diskette drive:
You cannot hot swap a diskette drive in the UltraBay II if drive A is assigned to the external diskette drive. The external diskette drive is the drive connected to the system's or to the SelectaBase 770 Port Replicator's external drive port, or the one installed in the docking station.

This applies to the following conditions:

- Your system starts with the external diskette drive attached and without a diskette drive in the UltraBay II.
- You set the FDD setting to External using PS2.EXE and start your system with neither the internal drive installed (in the UltraBay II) nor the external diskette drive attached.

If you hot or warm swap the DVD-ROM drive or CD-ROM drive, make sure the drive has stopped rotating.

Other IDE devices:

- **Hard disk drive**:
  You cannot use the hot and warm swap functions.
- **CD-ROM drive and DVD-ROM drive**:
  You cannot use the hot and warm swap functions in 2-channel IDE mode. Refer to the table on page 89.

Battery pack:
Do not hot swap a secondary battery from the UltraBay II when the system is working under the secondary battery power. The power might go off. You might have this situation if you have the secondary battery inserted in the UltraBay II and if:

- The AC Adapter is not connected and there is no primary battery.
- The AC Adapter is not connected and the primary battery power is low.

To see whether your computer is running under the secondary battery power, see the battery status indicator on the indicator panel.

Replacing an UltraBay II Device

Chapter 3 Protecting Your Computer

This chapter provides information about how to protect your computer from theft or unauthorized use. It also describes how to display your personal information, such as your name or address, on the password prompt screen.

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- Setting a Password 102
- Changing or Removing a Password 104
  - For a Power-On Password or Hard-Disk-Drive Password 104
  - For a Supervisor Password 106
  - Removing a Power-On Password with Supervisor Authority 109

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- Deleting the Personalization Window 114

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Using the Security Screw 116

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Using Passwords

The password-setting feature helps to prevent your computer from being used by others. Once you set a password, a prompt appears on the screen each time you power on the computer. You must enter your password at the prompt. You cannot use the computer unless you type the correct password.

You can set the following passwords on your computer:

Power-on password
Set the power-on password to protect your computer from use by another person. The power-on password is required both at startup and when resuming from suspend mode.

Hard-disk-drive password
The hard-disk-drive password provides an extra measure of security. Even if you set a power-on password, another user can remove the hard disk drive in your computer and put it in a different computer to access your data. If you set a hard-disk-drive password, however, another person cannot access the data on your hard disk without knowing the password. A hard-disk-drive password provides the following security features:

- You need to type the hard-disk-drive password at startup.
- If the hard disk drive is moved to another computer, the hard-disk-drive password must be typed at startup. Therefore, unauthorized users cannot access your hard disk even if the drive is removed from the computer.
- If you have not set a supervisor password, the hard-disk-drive password is required when the computer resumes from suspend mode.
- If you put a check mark in the **Prompt for password when computer goes off standby** check box in the “Power Management Properties” window, you are required to use the Windows 98 logon password to resume from suspend mode.

Supervisor password
The supervisor password is a tool provided for the system administrator to control many ThinkPad computers. The supervisor password is set by the system administrator and it is not required for users. Users can start the computer without

providing the supervisor password. The supervisor password is required only to access Easy-Setup. It provides the following security features:

- Only a system administrator can access Easy-Setup. If a supervisor password is set, a password prompt appears if you try to start Easy-Setup.
- You can use a power-on password to protect your data from unauthorized use.
- The system administrator can use the supervisor password to access the computer even if you have set a power-on password. The supervisor password overrides the power-on password.
- The supervisor password has priority over the hard-disk-drive password. The hard disk is protected by the supervisor password so that unauthorized users cannot access data on the hard disk.
- The system administrator can set the same supervisor password on many ThinkPad computers to make administration easier.

Other passwords
Some Microsoft operating systems provide special Windows passwords. Refer to that system user's guide for information on how to set, change, and use these passwords.

Entering a Password

Once you set a password, a password prompt appears at the top left corner of the screen. This prompt appears each time you power on your computer or when your computer returns from suspend mode to normal operation.

However, a password prompt is not displayed if the computer returns to normal operation because of a preset timer or an incoming call on the modem, in which case you will have to display it by pressing a key or moving the pointing device.

To enter a password, do the following:

1 Type your password.

The symbol appears each time you press a key. Don't hold down a key too long, because the same character will be entered continuously.

2 Press the **Enter** key.

An **OK** appears if you enter the correct password, and an **X** appears if you enter the wrong password. If you fail to enter the correct password in three tries, you must power off the computer, wait 5 seconds, and then power it on again and retry.

Setting a Password

To set a password, do the following:

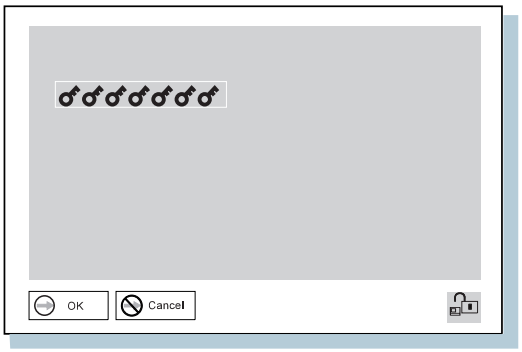
1 Start Easy-Setup.

a) Press and hold **F1**; then turn on the computer.
b) Hold **F1** until the “Easy-Setup” menu appears.

2 Click on **Password** in the “Easy-Setup” menu. For more information on the “Password” submenu “Easy-Setup” on page 17.

3 Click on the type of password you want to set: **Power-On**, **HDD**, or **Supervisor**.

4 Type your desired appropriate password.

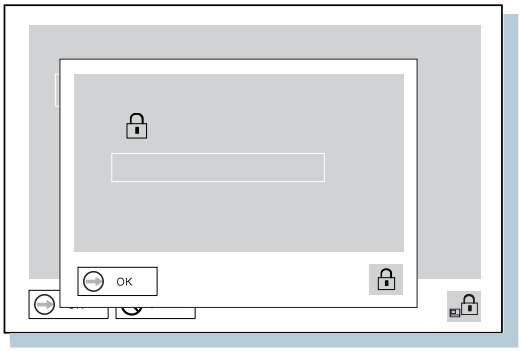


NOTE

You can type a maximum of seven random characters using a combination of letters (*A* to *Z*) and numbers (*0* to *9*). Uppercase and lowercase letters (for example, *A* and *a*) are treated as the same character.

If you type a wrong character, use the **Backspace** key to erase it and then type the correct one.

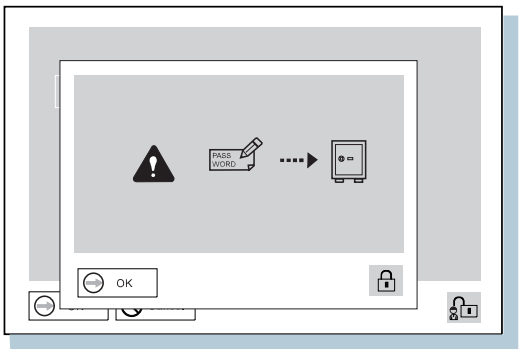
5 Press **Enter**. The “Password Confirmation” window appears:



6 Type your password again to verify it; then press **Enter** again.

NOTE

The following window appears if you are setting the hard-disk-drive or the supervisor password, reminding you to write down the password and keep it in a safe place:



Your password is set.

Do Not Forget Your Password

If you forget your hard-disk-drive or supervisor password, there is **no way to reset your password or recover data from the hard disk**. You have to take your computer to an IBM reseller or an IBM marketing representative to have the hard disk or the system board replaced. Proof of purchase is required, and an additional charge might be required for the service. Neither an IBM reseller nor IBM marketing representative can make the hard disk drive usable.

Changing or Removing a Password

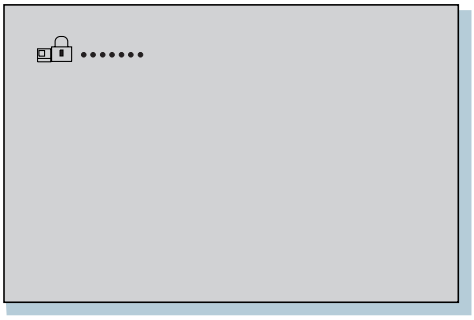
This security feature prevents someone from removing a password and using your computer. To change or remove a password, do the following:

For a Power-On Password or Hard-Disk-Drive Password

1 Power off the computer and wait at least 5 seconds; then power on the computer.

The password prompt appears.

2 Type your current password.

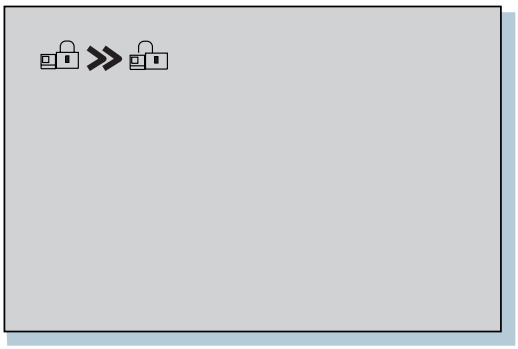


3 Press the **Spacebar**.

To change the password, go to step 4 .

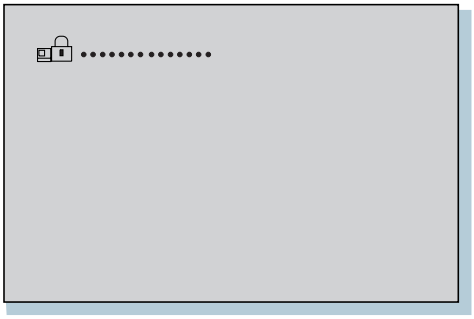
To remove the password, press **Enter**.

The following window appears, and the system starts:



You have removed your password. Skip the remaining steps.

4 To change the password, type the new password; then press the **Spacebar**.



5 Type the new password again to verify it; then press **Enter**.

The following window appears, and the system starts:

NOTE

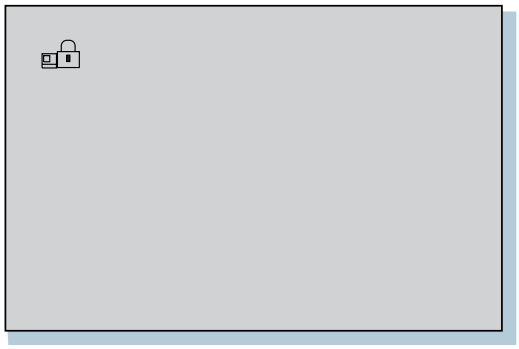
Write down the password and keep it in a safe place.

You have changed your password.

For a Supervisor Password

1 Start Easy-Setup.

a) Press and hold **F1**; then turn on the computer.
b) Hold **F1** until the password prompt appears.



2 Enter the supervisor password.

The “Easy-Setup” menu appears.

3 Select **Password** on the menu.

4 Select **Supervisor**.

To change the password, go to step 8 .

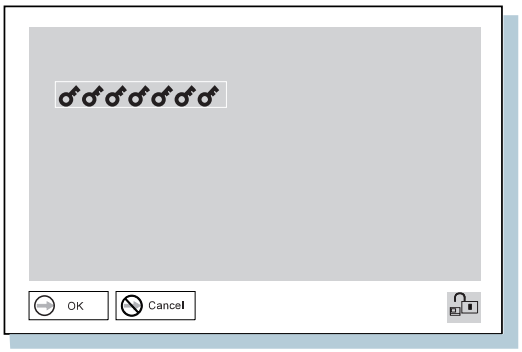
5 To remove the password, enter the current password and press the **Spacebar**.

6 Press **Enter** twice.

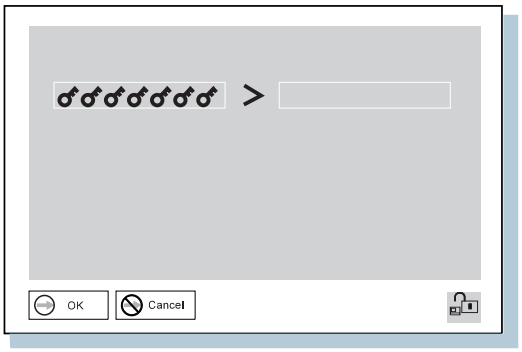
7 Click on **Exit**; then click on **Restart**.

The supervisor password has been removed. Your computer restarts. Skip the remaining steps.

8 Enter the current password and press the **Spacebar**.



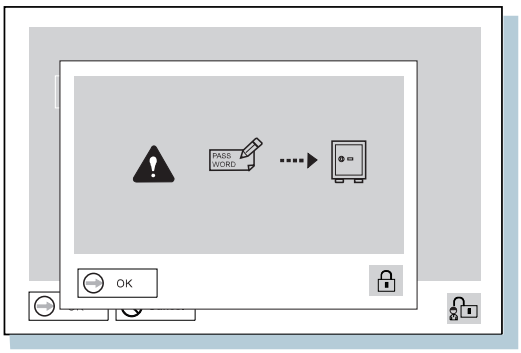
9 Type the new password; then press **Enter**.



10 Type the new password again to verify it; then press **Enter**.

NOTE

The following window appears, reminding you to write down the password and keep it in a safe place:



11 Press **Enter** again.

12 Click on **Exit**; then click on **Restart**.

The supervisor password has been changed. Your computer restarts.

Removing a Power-On Password with Supervisor Authority

You can remove a power-on-password (even if you don't know it) if you know the supervisor password.

1 Power on the computer by pressing **F1**.

The password prompt appears.

2 Enter the supervisor password.

The “Easy-Setup” menu appears.

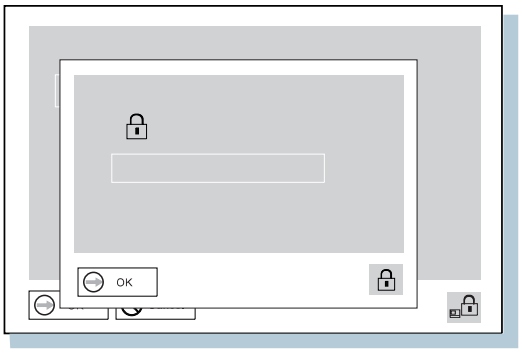
3 Select **Password** on the menu.

4 Select **Power on** on the menu.

5 Type the supervisor password; then press the **Spacebar**.

6 Press **Enter**.

The “Password Confirmation” window appears:



7 Press **Enter** again.

8 Click on **Exit**; then click on **Restart**.

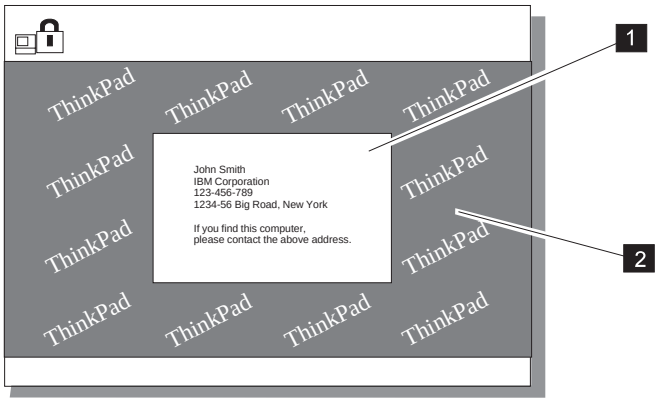
Your computer restarts. The power-on password has been removed.

Using the Personalization Editor

With the Personalization Editor, you can display such personal information as your name and address on the screen each time you power on your computer. This feature helps you to identify your computer when identical computers are being used in your location, or to deter theft.

Entering Your Personal Data

A personalized password-prompt window consists of two parts: the *personal data area* 1 and the *background bitmap area* 2 .



Using the Personalization Editor

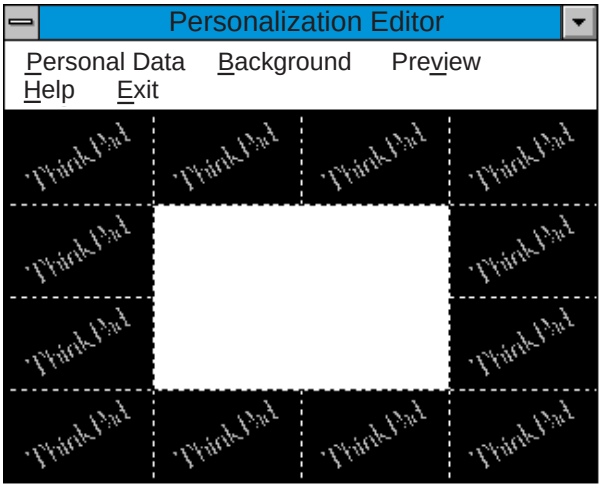
To register your name, address, and company on the Personalization Editor, do the following:

NOTE

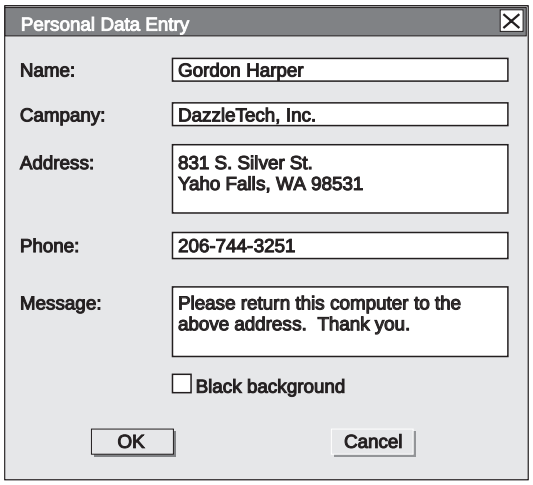
For this information to be displayed, the power-on password must already be set.

1. Power on the computer.
2. Make a backup copy of the *Utility Diskette for DOS, Personalization* with the Diskette Factory. (For more information → "Backing Up Your System" on page 32.)
3. Insert the backup copy of the *Utility Diskette for DOS, Personalization* into the diskette drive.
4. Open the **Personalization Editor**.
   a) Click on **Start**.
   b) Move the cursor to **Programs** and **ThinkPad**; then click on **Personalization Editor**.

   The following window appears:



5 Click on **Personal Data** and type the necessary information into the boxes; click on **OK** to save your data.



If you want to create the background bitmap, continue with step 6; otherwise, go to step 10.

6 Select **Background** in the “Personalization Editor” window.

Windows Paint automatically opens.

7 Draw an image or color the background.

Your bitmap size must be 160 by 100 pels. To change the size, select **Image** and then **Attribute**. Specify a **Width** of 160 and a **Height** of 100, and set **Unit** to pels.

8 Select **File** and **Save As** to save and name your drawing as a 16-color bitmap file on the backup copy of the *Utility Diskette for DOS, Personalization*.

NOTE

To preview the actual full size of the screen, select **Preview**.

9 Press **Enter** to return to the previous window.

10 Shut down the system, and power off the computer.

11 Insert the backup copy of the *Utility Diskette for DOS, Personalization* into the diskette drive; then power on the computer.

12 Select **Update personalization data** at the menu window; then follow the instructions on the window.

Your data is copied from the *Utility Diskette for DOS, Personalization* and stored in the nonvolatile memory in the computer.

13 After the data is stored, power off the computer.

14 Set your password if you have not yet set it.

Click on **Help** for more information.

The information that you typed in will be displayed the next time you power on the computer.

Deleting the Personalization Window

To delete the personalization window and revert to the default password prompt, do the following:

1 Power off the computer.

2 Insert the backup copy of the *Utility Diskette for DOS, Personalization* into the diskette drive; then power on the computer.

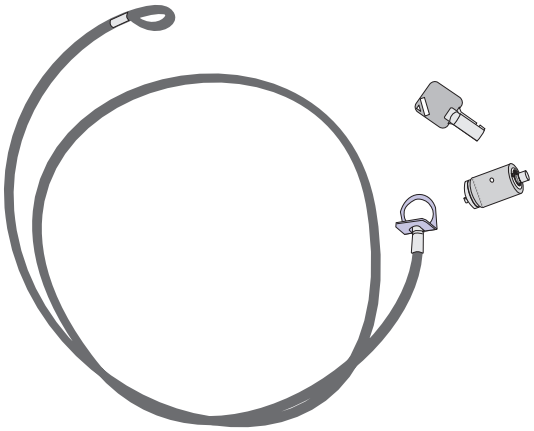
3 Select **Delete personalization data** from the menu; then follow the instructions on the screen.

4 After the data is updated, restart the computer.

Using Locks

You can attach a mechanical lock to your computer, to help to prevent it from being removed without your permission.

Attach a mechanical lock to the keyhole of the computer; then secure the chain on the lock to a stationary object. Refer to the instructions shipped with the mechanical lock. For information on the keyhole location → page 4.



NOTE

You are responsible for evaluating, selecting, and implementing the locking devices and security features. IBM makes no comments, judgments, or warranties about the function, quality, or performance of locking devices and security features.

Using the Security Screw

You can use the security screw shipped with your computer to prevent devices, such as a hard disk drive, from being removed easily.

Security Screw

To replace the coin screw with the security screw, do as follows:

1. Power off the computer; then disconnect the AC Adapter and all cables from the computer.
2. Remove the screw with a coin; then install the security screw and tighten it with a 2.5-mm allen wrench.
3. Connect the AC Adapter; then power on the computer.

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Hints and Tips

This section provides hints and tips, as well as information on limitations.

For Windows 98:

In Windows 98, it takes longer to enter suspend mode and resume normal operation than it does in Windows 95. This performance difference is a result of Windows 98, not the ThinkPad features.

For more information about Windows 98, see the following Web site:
http://www.ibm.com/thinkpad

See the following site for technical support:
http://www.pc.ibm.com/support

Three power modes are described in this book: **standby mode**, **suspend mode**, and **hibernation mode**. You can enter these modes as follows:

- **Fn + F3** standby mode
- **Fn + F4** suspend mode
- **Fn + F12** hibernation mode

The computer also enters suspend mode or hibernation mode from other triggers. For example, if you select **Stand by** in the **Shut Down...** menu when you click on the **Start** button at the bottom left of the Windows 98 screen, you can enter suspend mode. Also, you can set the **system standby timer** in the "Power Management Properties" window to specify a timeout for entering suspend mode.

The term *standby* in the Windows 98 screen has a different meaning from the term *standby mode* in this book.

For more information → "Basic" in the *Online User's Guide*.

For Windows 95:

If you are using the Intel USB camera and the system resumes from suspend mode, the USB camera is disabled. To enable it, unplug it and plug it in again.

Because of the CD-ROM or DVD-ROM drive property settings, your computer might not enter suspend mode or hibernation mode after the end of a timeout period specified in the ThinkPad Configuration program when the drive is installed in UltraBay II. If you want to use suspend mode and hibernation mode, change the properties of the CD-ROM or DVD-ROM drive as follows:

1. Click on **Start** and move the cursor to **Settings** and **Control Panel**. Then click on **Control Panel**.
2. Double-click on **System**.
3. Click on the **Device Manager** tab, and double-click on **CD-ROM**.
4. Click on the CD-ROM or DVD-ROM drive name under **CD-ROM**; then click on the **Properties** button.
5. Click on the **Settings** tab and remove the check mark from the **Auto insert notification** check box in **Options** by clicking on it.
6. Click on **OK** to restart the computer.

For Windows NT:

For Windows NT 4.0, hibernation is not supported if the drive is formatted by NTFS.

For more information, refer to the following Web site:
http://www.pc.ibm.com/support

If you insert a PC Card into the PC Card slot, there might be an **X** mark in the list of the card information in the “PC Card [PCMCIA] Device” window in the **Control Panel**. The **X** does not affect any function, however.

If you use the MPEG driver in Windows NT 4.0, consider the following restrictions:

– Any multimedia player application provided by a third party or a custom player application created for Windows NT is not

guaranteed to work with this driver. Only the “Media Player” application (`mplay32.exe`) has been tested and verified.

– If you have already installed Active Movie and Internet Explorer 3.01, included in the Windows NT 4.0 Service Pack 3, you see the following caution after installing the MPEG-2 driver and starting Windows NT again:

  ```
  Caution
  Some of the file types usually associated with
  ActiveMovie are currently associated with other
  programs.  Because of this, you may be unable to play
  certain types of multimedia files.  Do you want to fix
  this (by restoring the file type to ActiveMovie)?
  ```

  Select **No** and click on **Don't ask this question again**.

– Running more than one video application sharing the same video hardware is not supported. For example, while an MPEG file is playing, the video capture application does not work. Also, you cannot play an ActiveMovie while an MPEG media player application is running.

– You can display a video window to an external monitor (CRT) or to a TV with the NTSC or PAL color standard:

  The following are not supported, however:

  - Any resolution/color depth at the 47/87 refresh rate
  - 800×600/16M colors with any refresh rate (video memory limitation)
  - 1600×1200/any colors with any refresh rate (video memory limitation)
  - 16 colors with any resolution or refresh rate

– While an MPEG file is playing through Media Player, suspend and resume are not supported. You need to pause or stop the playback mode before entering suspend mode.

If you enter suspend mode while playing a music CD with the “CD Player” application of Windows NT in the DVD-ROM drive, the “CD Player” window will show **No disc** in its panel after resuming normal operation, because Windows NT does not support APM mode. To recover, close the “CD Player” window and open it again; then you can play a music CD.

Hints and Tips

If you use the Video Capture driver in Windows NT 4.0, consider the following:

- Windows NT color depth changes affect the captured data (preview, overlay). Close the video capture application before changing color depth, and then restart the application.
- As a client of the ThinkPad Power Management Port driver, the Video Capture driver has power management support. You must have first installed the ThinkPad Configuration program, however. Otherwise, the driver will not function properly when the hardware changes power states. If the captured image does not appear properly, restart the capture application.
- Before running a capture application that uses this driver, close any application the uses the IBM MPEG-2 driver (for example, Media Player). Also if a capture application is running, do not attempt to start an application that uses the IBM MPEG-2 driver, or any other application that uses the capture driver.
- For preview mode, you can select image dimensions based on the available space in video memory. For overlay mode, you can choose from all sizes (40×30 to 640×480). Note the following when you use the VIDECAP32.EXE Video Capture application:
  - Size the capture display window and set a capture format so that the scrollbars are visible. Set the scrollbars to any position other than the top on the vertical scrollbar and left on the horizontal. Then resize the display window or change the capture format so that scrollbars are no longer visible. The captured image now appears split either vertically or horizontally, because `VIDCAP32.EXE` continues to inform the driver about the scrollbar settings, even though the scrollbars are no longer visible. To fix this, resize the display window or change the capture form so that the scrollbars are visible again, and then reset the scrollbars.
  - Select a size for overlay greater than the maximum supported for preview. The driver displays a dialog box informing you that the size selected should not be used for preview. If you change to preview mode with the

same size, the image displayed could be distorted, and the cursor might be corrupted. To fix this, select a valid size using the Video Format dialog. To restore the cursor, drag it to the bottom of the screen. `VIDCAP32.EXE` assumes that preview and overlay are both supported for the same sizes. So if the application is on overlay mode, and you select preview mode without selecting a valid size, the driver is informed that it should preview to the same size. But since an image of this size cannot be captured in the frame buffer, the captured image looks distorted and the cursor image is also affected. This is also a problem if you use Digital Video Producer.

– This driver does not provide the YUV422 video codec needed for preview/capture mode application that needs to use YUV422 video compression codec. Install the YUV422 codec that is available in Windows NT 4.0 CD-ROM. YUV422 codec is available in Drvlib/Capture/I386 directory on the Windows NT 4.0 CD-ROM.

– Overlay mode is not supported for the following resolution, color depth, and refresh rate combinations:

  - 1024×768×256 colors, 43 Hz
  - 1024×768×256 colors, 87 Hz
  - 1024×768×64K colors, 43 Hz
  - 1024×768×64K colors, 87 Hz
  - 1280×1024×256 colors, 43 Hz
  - 1280×1024×256 colors, 87 Hz
  - 1600×1200×256 colors, 48 Hz

– If you connect your computer to external TV, Video Capture will not work. It works only if the display output location is either the external monitor or the LCD.

– Do not change the display output location while the Video Capture application is running.

For Windows 3.1:

If a memory shortage or memory error occurs, do as follows:

1. Unload any unnecessary drivers from the CONFIG.SYS file. (For example, unload printer drivers if you do not use a printer.)
2. Reconfigure the UMB (upper memory block) using the `DEVICEHIGH` statement.
3. Use the multiple configuration setup for DOS (refer to the documents supplied with DOS).

   Use the DOS command `command MEM /C` to review your DOS memory usage occasionally.

If you have installed more than 256 MB of memory, check the `[386Enh]` section of the SYSTEM.INI file and do one of the following:

- If the `PageOverCommit` line is in the file, make sure its value is 3. (If it is not, change it to 3.)
- If the `PageOverCommit` line is not in the file, add `PageOverCommit=3`

After you change or add the value, shut down Windows 3.1 and power off the computer; then power it on again after 5 seconds.

The `PageOverCommit` value could be 2 or 1.

For more information on the `PageOverCommit` value Windows 3.1 manuals.

For OS/2 Warp:

If you have formatted your drive using high-performance file system (HPFS) and your system has more than 64 MB memory installed, hibernation mode is not supported.

If the COM port does not work even though you have set it up correctly with the ThinkPad Configuration program, do as follows:

1. Open **System Setup**.
2. Select **Hardware Manager**.
3. Select a folder from the menu.
4. Select **Properties**.
5. In the default pull-down menu, select **No Hardware Detection**. If it has already been selected, change the setting.
6. Open the ThinkPad Configuration program.
7. Set the COM port as desired.
8. Restart the system.

To receive incoming faxes or mail, you must set the modem settings in the fax application to one of the following:

- Hardware FIFO enabled
- Hardware Flow Control on
- UART 16550A modem

In OS/2 FaxWorks for example, select **Utilities**, **Settings**, **Modem Type**, and **Use HW FIFO (16550A)**.

If you do not set your modem to one of these settings, you will not be able to receive an incoming fax or an incoming call in suspend mode.

If you do not have the PC Card device driver for OS/2 but you have one for DOS, your PC Card might run in the VDM (virtual DOS machine) environment. Refer to the *Online User's Guide* for setting the VDM and the sample configuration files on the PC Card Installation Diskette for OS/2, Windows 95, Windows 98. (If the PC Card Installation Diskette did not come with the computer, create it using the Diskette Factory program.)

DOS **For DOS:**

If a memory shortage or memory error occurs, do as follows:

1. Try the same actions as described for Windows 3.1.
2. Unload any unnecessary programs from the WIN.INI file (for example, FUELWIN for ac operations).

You can use the ThinkPad Configuration program from the DOS prompt. To start the program, do the following:

1. Click on **Start**; then click on the **DOS Prompt** icon.

   The DOS prompt window appears.

2. Type PS2 ? at the DOS prompt.

   The “ThinkPad Configuration” online help window appears:

```
C:\>PS2 ?

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    with IBM Corp.

Command Syntax:  PS2   [Parameter1] [Parameter2] [Parameter3]

Following are available [Parameter1].
For the complete command syntax, type 'PS2 ?
[Parameter]'.

1.Power Management related
```

3. Select an item from the menu, and follow the instructions on the screen to set the features.

   You can also create a batch file like the one shown to match your operating environment. The following sample batch file sets a longer battery operating time:

```
@Echo Off

Rem SAMPLE:Set the parameters to provide maximum power utilization.

Rem ============================================================

PS2 PMode Custom DC                > Nul
PS2 LCd 3                         > Nul
PS2 DISK 3                        > Nul
PS2 POwer 5                       > Nul
PS2 SPeed Fixed Slow               > Nul
PS2 IR Disable                    > Nul
PS2 SErial OFf                    > Nul
```

Using the Hard Disk Drive

You can use only 7.9 GB of the hard disk drive of your computer in the Windows 3.1 or DOS environment. If you install a hard disk drive with greater capacity, you cannot use all of it.

Using a Docking Station

For USB connector considerations when using a docking station, see “Using the USB Connector” on page 128.

Hot or Warm Docking to a Docking Station (Windows 95 and Windows 98 Only)

You might not be able to hot or warm dock your computer to the SelectaDock docking station when certain PCI cards, PnP ISA cards, and PC Cards are installed in the docking station. If such a condition occurs, restart the system.

Using a PC Card with the Docking Station

In the Windows 95, Windows NT, Windows 3.1, or DOS environment, you need to install the PC Card support software *after* docking your computer to the docking station. If you have already installed the PC Card support software, uninstall it and then reinstall it after you dock your computer to the docking station.

Using the USB Connector

If your computer tries to enter suspend mode and the request is rejected, the device in the USB connector might be disabled. If this occurs, do a hot-unplug-and-plug operation for the USB device.

For PCI Cards in the SelectaDock III Docking Station: If the setting of the USB connector on your computer is enabled (the default setting), do not use a PCI Video Card and a PCI Network Card at the same time in the SelectaDock III docking station. Your system cannot boot if both cards are inserted.

For the USB Connector Setting on the SelectaDock III Docking Station: Do not disable the USB connector on the SelectaDock III. If you disable it, the system might hang during a hot- or warm-dock or -undock operation. If this occurs, restart the system.

Using the DVD-ROM Drive

Do not switch the display mode from the LCD to the external monitor while viewing a DVD with video content, such as a DVD movie or business presentation. You need to change the display mode before you open an MPEG file to play.

Using a PC Card

After your computer returns from standby mode to normal operation, you cannot perform hot-plug and -unplug operations for certain Network PC Cards in the docking station slots. Restart the system to solve the problem.

If you are communicating with a PC Card modem or inserting a PC Card in a PC Card slot, do not enter your computer into suspend mode, enter into hibernation mode, or click on **Stand by** in the “Shut Down Window” window.

Note: If you want to enter your computer into suspend mode, first stop the PC Card in the “PC Card (PCMCIA) Properties” window as follows:

1. Click on **Start**, move the cursor to **Settings**, and click on **Control Panel**.
2. Double-click on **PC Card (PCMCIA)**.
3. From the list, select the card you are stopping.

4. Click on the **Stop** button.

If you remove a communication PC Card from the PC Card slot and then reinsert it later, it might not work correctly. You need to restart your computer.

If you install a PC Card after replacing a CD-ROM drive with a diskette drive, and then later reinsert the CD-ROM drive, the card might lose its resource name for working. A CD-ROM drive (secondary IDE) always uses IRQ 15, but after it is replaced with a diskette drive, IRQ 15 will be free, and Windows 95 or Windows 98 will assign it to a new PC Card. But IRQ 15 must be taken over with IDE2 when a CD-ROM drive is reinserted.

Using a Second CardBus Card

If a CardBus Card is already configured in your computer, you must configure a second CardBus manually by using the Device Manager. To get to the Device Manager, click on the **System** icon in the Control Panel.

Using a Microphone

If you are using a microphone with your computer, use the ThinkPad-option headset. Some microphones, such as condenser microphones, might need a battery. See the instructions that come with the microphone.

The microphone/line-in jack of your computer supports either microphone input or line-in input but not both. You need to mute the function you don't use, as follows:

1. Click on **Start**.
2. Move the cursor to **Programs**, **Accessories**, **Entertainment**, and then **Volume Control**.

   The “Master Out” window appears.
3. Move the cursor to the **Options** menu; then click on **Properties**.
4. Put the check mark in the **Line In** or **Mic** check box under the **Show the following volume controls**; then click on **OK**.

The volume control you have chosen in the “Properties” window appears in the “Master Out” window.

5 Put a check mark in the **Mute** check box in the column that you don't use—either **LINE** or **MIC**.

Using an External Condenser Microphone

The microphone/line-in jack supports the following type of microphones:

A dynamic microphone
A self-battery-powered condenser microphone

If you want to use an electric condenser microphone, you must use one that provides its own power source.

Troubleshooting Guide

The following chart shows how to find or solve a problem.

If a beep sounds, if a message appears, or if a function-related problem occurs:

1 Find your symptom from the table and try solving the problem.	→ "Troubleshooting Charts" on page 132.
2 If you can't solve the problem, run the test and make sure the hardware and the device drivers are OK.	→ "Testing Your Computer" on page 164.
3 Note the error code and have the computer serviced.	→ "Getting Service" in the *Online User's Guide*.

If you accidentally lose or damage software in your computer:

Recover it by using either the ThinkPad Customization CD, the Recovery CD, or the Diskette Factory.	→ "Using the ThinkPad Customization CD" on page 32, "Using the Recovery CD" on page 33, and "Using the Diskette Factory" on page 36.

Troubleshooting Charts

If your computer has an error, it typically displays a message or an error code, or a beep sounds when you power it on. Go through the charts and look for your problem. If you find your problem, go to the page indicated and do the specified action. The troubleshooting charts address problems in general, and some descriptions might not apply to your particular computer or suit your situation. Compare the features or options of your computer with this book or the shipping checklist.

Troubleshooting Chart	Page
Error codes or messages	134
No error codes or messages	140
Input problems	140
Suspend or hibernation problems	142
LCD problems	145
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Troubleshooting Chart	Page
Other problems	163

Error Codes or Messages

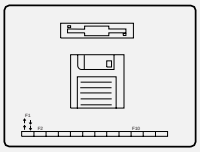
Note: In the charts, *x* can be any character.

Message	Cause and Action
I9990301 I9990302 I9990305 (Incorrect connection of the hard disk drive may cause these error codes to appear.)	Your computer can't find the startup drive. Do the following: 1. Power off the computer. 2. Press and hold **F1**; then power on the computer to start Easy-Setup. Hold **F1** until the Easy-Setup menu appears. 3. Select the **Start up** icon. 4. Select the **Power-on** icon. If you are unable to set the startup sequence, have the computer serviced. 5. Check the devices in the startup sequence box. Is the default drive listed in the startup sequence box? **Yes** Exit this window, and power off the computer. **No** Select the **Reset** icon. 6. Is an operating system installed? **Yes** Go to step 8. **No** Install the operating system in your computer. 7. After you install the operating system, power off the computer. 8. Power on the computer. If the same screen message appears, have the computer serviced.
I99*xxxxx* (except the above I999030x errors)	Have the computer serviced.
111 (docking station error)	If you are using a port replicator or a docking station, disconnect it; then reconnect it. If you still have a problem, refer to the manual shipped with your port replicator or docking station.

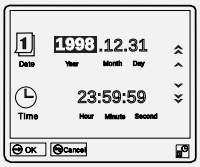
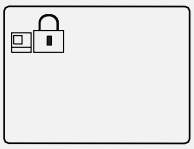
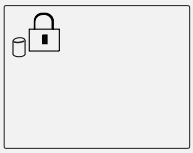
Message	Cause and Action
158 (supervisor password error)	A hard disk drive was installed with a different supervisor password, or it did not have a hard disk password. The hard disk drive with the error can be in any of the following: The main bay of your computer The UltraBay II The UltraBay II tray of the docking station attached to your computer. To solve the problem, do the following: 1. Make sure a hard disk drive without the error is installed in the main hard disk bay of your computer. If the hard disk drive is installed in the UltraBay II tray of the docking station, power off the computer and reinstall it into the main hard disk bay of your computer. Then power the computer on again. 2. Press **Enter**. 3. Type your supervisor password at the power-on password prompt. If the 158 error appears again, press **Enter** to proceed to the Easy-Setup "Password" submenu. 4. Select the **Supervisor** icon; then press **Enter**. The same password as the supervisor password is set for the hard disk password on the main hard disk bay. 5. Restart the computer.
159 (supervisor password error)	The hard disk password differs from the supervisor password. The hard disk drive with the error can be in any of the following: The main hard disk drive bay of your computer The UltraBay II The UltraBay II tray of the docking station attached to your computer To solve the problem, do the following: 1. Make sure the hard disk drive password and the supervisor password differ. If the hard disk drive is in the UltraBay II tray of the docking station, power off the computer and reinstall it into the main bay of your computer. Then power on the computer again. 2. Change the hard disk password to the supervisor password at the hard disk password prompt.
16*x* or 17*x* (undefined date or configuration error)	Follow the instructions on the screen.

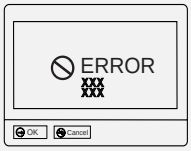
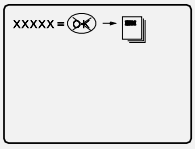
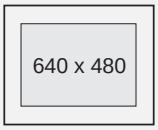
Troubleshooting Charts

Message	Cause and Action
174 (device configuration error)	Make sure that the hard disk drive and the device in the UltraBay II are firmly installed. If the problem persists, have the computer serviced.
175, 177, 178 (EEPROM error)	Have the computer serviced.
183 (invalid password error)	The password entered at the supervisor password prompt is invalid. Check your supervisor password.
184 (invalid password error)	The password entered is invalid. Power off the computer and wait at least 5 seconds; then power it on again and type the correct password.
185 (startup sequence error)	The startup sequence is invalid. Power off the computer and wait at least 5 seconds; then power it on again to reset the startup sequence in Easy-Setup.
190 (critical low-battery error)	The computer powered off, because the battery is low. Connect the AC Adapter to the computer and charge the battery pack, or replace the battery pack with a fully charged one.
192 (cooling fan error)	Have the computer serviced.
195 (hibernation error)	The system configuration differs between the time your computer entered hibernation mode and the time it exited this mode, and your computer cannot resume normal operation. Change the system configuration to what it was before your computer entered hibernation mode. If the memory size was changed, re-create the hibernation file. If you are using a docking station, undock the computer from the docking station before you enter hibernation mode.
196 (hibernation error)	The computer cannot read the hibernation file. Have the computer serviced.
225 (unsupported memory)	The installed DIMM is not supported. **Note:** For example, this error occurs when you attempt to install EDO DRAM, which your computer does not support.
2*xx* (memory error)	Make sure that the DIMM option is correctly installed.

Message	Cause and Action
30*x* (keyboard error)	Make sure that no object is placed on the keyboard or on the external keyboard, if you have one. Power off the computer and power off all attached devices. Power on the computer first; then power on the attached devices. If you still have a problem, do the following: If an external keyboard is connected, do the following: – Power off the computer and disconnect the external keyboard; then power on the computer. Make sure that your keyboard operation is correct. If it is, have the external keyboard serviced. – Make sure that the external keyboard is connected to the correct connector. Test the computer by selecting the **Start** icon in the Easy-Setup "Test" submenu. – If the computer stops during the test, have the computer serviced.
6*xx* (diskette error)	Have the computer serviced.
11*xx* (serial port error)	Have the computer serviced.
12*xx* (infrared error)	Have the computer serviced.
17*xx* (hard disk error)	Have the computer serviced.
1801 (unsupported port replicator)	The attached port replicator is not supported.
24*xx* (video error)	Have the computer serviced.
808*x* (PC Card slot error)	Have the computer serviced.
860*x* (pointing device error)	Make sure that the external mouse or the external keyboard is connected correctly. If it is connected correctly, have the computer serviced.
Diskette and **F1** prompts 	Make sure that the hard disk drive is correctly installed. Or, make sure that the self-starting diskette is inserted correctly (with the label facing up and metal-shutter end first) in the diskette drive. If it is, press **F1**. If both prompts remain, have the computer serviced.

Troubleshooting Charts

Message	Cause and Action
A 163 error appears and then the *Date and Time* window appears. 	Neither the date nor the time is set in the computer. Set the date and time by typing or clicking on ▲ or ▼ to set the values; then click on **OK**. If both the power-on password and supervisor password are set, do the following: 1. Power on the computer. The password prompt appears after the error code. 2. Type the supervisor password, not the power-on password. An error window appears. 3. Click on **OK** or press **Enter**. 4. Set the time and date in the next window; then press **Enter**. The system restarts. **Note:** If the power-on password is rejected, reset the power-on password using Easy-Setup.
The power-on password prompt 	A power-on password or supervisor password is set. Type the correct password and press **Enter** to use the computer (see page 102). If the power-on password is not accepted, a supervisor password might have been set. Type the supervisor password and press **Enter**. If you still have a problem, have the computer serviced.
The hard disk password prompt 	A hard disk password is set. Type the correct password and press **Enter** to use the computer (see page 102). If you still have a problem, have the computer serviced.
The “Test” submenu 	Select the **Start** icon and follow the instructions to test your system. If you cannot complete the test, have the computer serviced. If the test does not find the problem but the problem persists, see if you can find your problem in the troubleshooting charts. If the test ends in an error, note the error code and have the computer serviced.

Message	Cause and Action
	This message appears when you restart your computer and after you change the IDE channel from 2 to 3. Power off the computer and wait at least 5 seconds; then power it on again.
A POST error prompt 	An error was found during POST. Press **Enter**; then select **Start** from the "Test" submenu and run the test. If the test ends in an error, note the error code and have the computer serviced.
An error prompt 	Power off the computer and start Easy-Setup; then select **Test** to test the computer. If the test ends in an error, note the error code and have the computer serviced. You can start the operating system by pressing **F1** instead, and ignore the error.
The DOS full-screen looks smaller. 	If you use a DOS application that supports only the 640x480 resolution (VGA mode), the screen image might look slightly distorted or might appear smaller than the display size. This is to maintain compatibility with other DOS applications. To expand the screen image to the same size as the actual screen, start the ThinkPad Configuration program and click on **LCD** ( ); then select the **Screen expansion** function. (The image may still look slightly distorted.) **Note:** You can use the **Fn**+**F8** keys to do the same thing if your computer has screen expansion function.
A panel or message that is not listed in the troubleshooting charts.	Power off the computer and start Easy-Setup; then select **Test** to test the computer. If the test ends in an error, note the error code and have the computer serviced. If you cannot start Easy-Setup, have the computer serviced.
xxxxx **KB OK** appears and the computer stops.	Have the computer serviced.

No Error Codes or Messages

Problem	Cause and Action
The screen is blank and you do not hear any beeps. **Note:** If you are not sure whether you heard any beeps, power off the computer; then power it on again, and listen again. If you are using an external monitor, go to "External Monitor Problems" on page 157.	If a power-on password is set, press any key to display the power-on password prompt, and then type the correct password and press **Enter** (see page 102). If the power-on password does not appear, the brightness control lever might be set to minimum brightness. Adjust the brightness level. If the screen still remains blank, make sure that: The battery pack is installed correctly. The AC Adapter is connected to the computer and the power cord is plugged into a working electrical outlet. The computer power is on. (Turn on the power switch again for confirmation.) If these items are correct and the screen remains blank, have the computer serviced.
The screen is blank and you hear a continuous beep, or two or more beeps.	Have the computer serviced.
Only the cursor appears.	Reinstall your operating system and power on the computer. If you still have a problem, have the computer serviced.

Input Problems

Problem	Cause and Action
The cursor does not move after the computer awakens from one of the power management modes.	Make sure you followed the instructions in "Advanced" in the *Online User's Guide* correctly when you installed Windows with the Advanced Power Management (APM) option.

Problem	Cause and Action
All or some keys on the keyboard do not work.	If the problem occurred immediately after the computer returned from suspend mode, enter the power-on password if it is set. If an external keyboard is connected, the numeric keypad on your computer will not work. This is not a defect. If an external numeric keypad or a mouse is connected: 1. Power off the computer. 2. Remove the external numeric keypad or the mouse. 3. Power on the computer and try using the keyboard again. If the keyboard problem is resolved, check the connection of the external numeric keypad, external keyboard, or mouse. If you still have a problem, have the computer serviced.
The cursor drifts when the computer is powered on or after it resumes normal operation.	The cursor might drift when you are not using the TrackPoint during normal operation. This is a normal characteristic of the TrackPoint and is not a defect. Cursor drifting might occur for several seconds under the following conditions: When the computer is powered on. When the computer resumes normal operation. When the TrackPoint is pressed for a long time. When the temperature changes.
The cursor does not work for a while after the settings in the "TrackPoint Properties" window have been changed.	This is a normal characteristic of the cursor. Wait several seconds until the cursor returns to the normal state.
The mouse or pointing device does not work.	Make sure that the pointing-device cable is enabled in the ThinkPad Configuration program. Make sure that the mouse or pointing-device cable is securely connected to the computer. Try using the TrackPoint. If the TrackPoint works, the error might be due to the mouse. If your mouse is incompatible with the IBM PS/2 mouse, disable the TrackPoint using the ThinkPad Configuration program. **Note:** See the manual supplied with the mouse for more information.
The mouse buttons do not work.	Change the mouse driver to **Standard PS/2 Port Mouse**, and then reinstall **PS/2 TrackPoint**. See "Advanced" in the *Online User's Guide* for how to install the driver.
The scrolling or magnifying glass function does not work.	See the **General** tab page in "Mouse Properties," and make sure that the **PS/2 TrackPoint** driver is installed.
A number appears when you type a letter.	The numeric lock function is on. To disable it, press and hold **Shift**; then press **NumLk**.

Problem	Cause and Action
All or some keys on the external numeric keypad do not work.	Make sure that the external numeric keypad is correctly connected to the computer.
All or some keys on the external keyboard do not work.	To use an external keyboard, you need to attach the keyboard/mouse cable to the computer. Make sure that: The keyboard/mouse cable is correctly connected to the computer. The keyboard cable is connected to the correct side of the keyboard/mouse cable. If these items are correct, disconnect the keyboard/mouse cable from the computer and make sure that the operation of the system keyboard is correct. If the system keyboard works, have the keyboard/mouse cable or the external keyboard serviced.

Suspend or Hibernation Problems

Problem	Cause and Action
The computer enters suspend mode automatically.	The computer enters suspend mode automatically when the processor temperature reaches a certain level. This is not a defect.
The computer enters suspend mode immediately after POST (the suspend indicator turns on).	Make sure that: The battery pack is charged. The operating temperature is within the acceptable range. Refer to Appendix A. If these items are correct, have the computer serviced.
Error 19 appears and the computer immediately powers off.	The battery power is getting low. Connect the AC Adapter to the computer, or replace the battery pack with a fully charged one.
The LCD is blank after resuming.	Check if an external monitor was disconnected while the computer was in suspend mode. **Do not disconnect the external monitor while the computer is in suspend mode or hibernation mode. If no external monitor is attached when the computer resumes, the LCD remains blank and output is not displayed. This restriction does not depend on the resolution value.**

Problem	Cause and Action
The computer does not return from suspend mode, or the suspend indicator stays on and the computer does not work.	The computer automatically enters suspend or hibernation mode when the battery power is empty. Do one of the following: Replace the battery pack with a fully charged one and then press **Fn**. Connect the AC Adapter to the computer; then press **Fn**.
Your computer does not enter suspend or hibernation mode.	Check if the any option has been selected to disable your computer from entering suspend or hibernation mode. For more information → "Basic" in the *Online User's Guide*.

The computer does not enter suspend mode as set by the timer under Windows 98 or Windows NT.	**For Windows 98:**
	The Windows 98 generic CD-ROM or DVD-ROM driver accesses the internal CD-ROM drive or DVD-ROM drive every 3 seconds to see if a CD-ROM is inserted in the CD-ROM drive or DVD-ROM drive. This prevents your computer from entering suspend mode even after a timeout.
	To prevent this from occurring, do the following:
	1. Double-click on **My Computer**, **Control Panel**, and **System**.
	2. Click on the **Device Manager** tab.
	3. Click on the + mark of **CD-ROM**.
	4. Double-click on the CD-ROM or DVD-ROM name.
	5. Click on the **Setting** tab.
	6. Remove the check mark from **Auto insert notification**.
	Windows 98 no longer detects the CD-ROM or DVD-ROM insertion automatically.
	For Windows NT:
	The computer does not enter suspend mode through the timer if you enable the CD-ROM AutoRun feature. To enable the timer in this situation, edit the configuration information in the registry as follows:
	`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Cdrom\`
	`Autorun: x1 → Autorun:`

Troubleshooting Charts

Problem	Cause and Action
The computer does not enter hibernation mode with the **Fn**+**F12** key combination.	Enable hibernation mode as follows: **For Windows 98:** 1. Start the ThinkPad Configuration program. 2. Click on **Power Management** ( ). 3. Click on the **Hibernation** tab. 4. Click on the **Enable hibernation...** button. 5. Click on the **Create Now** button. The computer cannot enter hibernation mode if you are using one of the IBM communication PC Cards. To enter hibernation mode, stop the communication program, and then remove the PC Card or disable the PC Card slot using the **Control Panel**. **For Windows NT:** **Note:** You must format your hard disk with the FAT format system to use hibernation mode in Windows NT. If you format your hard disk with NTFS, the Windows NT default format, you cannot use hibernation mode. 1. Start the ThinkPad Configuration program. 2. Click on **Power Management** ( ). 3. Click on **Suspend/Resume Options** ( ). 4. Click on **Enable Hibernation**. 5. Click on **OK**. The computer cannot enter hibernation mode when you are using one of the IBM communication PC Cards. To enter hibernation mode, stop the communication program, and then remove the PC Card or disable the PC Card slot using the **Control Panel**.

LCD Problems

Problem	Cause and Action
The screen is unreadable or distorted.	Make sure that: The display device driver is installed correctly. The display resolution and color depth are correctly set. The monitor type is correct. To check under Windows 98, do as follows: 1. Click on **Start**. 2. Move the cursor to **Settings** and **Control Panel**. 3. Click on **Control Panel**, and then double-click on **Display**. 4. Select the **Settings** tab. 5. Check if the color depth and resolution are correctly set. 6. Click on **Advanced...**. 7. Select the **Adapter** tab. Make sure it shows “IBM ThinkPad (Cyber 9397 DVD).” 8. Select the **Monitor** tab. Make sure the information is correct.
Incorrect characters appear on the screen.	Did you install the operating system or application program correctly? If they are installed and configured correctly, have the computer serviced.
The screen stays on even after you power off your computer.	Press the reset switch with the tip of a pen and power off your computer; then power it on again.
Missing, discolored, or bright dots appear on the screen every time you power on your computer.	This is an intrinsic characteristic of the TFT technology. Your computer's display contains multiple thin-film transistors (TFTs). A small number of missing, discolored, or bright dots on the screen might exist all the time.

Indicator Problems

Problem	Cause and Action
The battery status indicator does not go on even though a battery pack is installed in the computer.	The over-current protection device inside the battery pack has been activated. Wait several hours and try again. If the indicator does not go on, replace the battery pack or have the computer serviced.
The **diskette-drive-in-use** icon stays on.	If a diskette is in the drive, make sure that: – The internal or external diskette drive is firmly connected to the computer. – The diskette contains the necessary files to start the system. – There is nothing wrong with your application program. – There is nothing wrong with the diskette. – The diskette is inserted correctly (label facing up and the metal-shutter end first) in the diskette drive. If these items are correct, have the computer serviced. If there is no diskette in the drive, have the computer serviced.

Battery Problems

Problem	Cause and Action
The battery pack cannot be fully charged in 3.5 hours by the power-off charging method.	The battery pack might be over-discharged. Do the following: 1. Power off the computer. 2. Make sure that the over-discharged battery pack is in the computer. 3. Connect the AC Adapter to the computer and let it charge. If the battery pack cannot be fully charged in 24 hours, use a new battery pack. If the optional Quick Charger is available, use it to charge the over-discharged battery pack.
Your computer shuts down before the battery status indicator shows empty, ***–or–*** Your computer operates after the battery status indicator shows empty.	Repeat discharging and charging the battery pack at least three times.

Problem	Cause and Action
The operating time for a fully charged battery pack is short.	Repeat discharging and charging the battery pack three to six times. If you still have a problem, use a new battery pack.
The computer does not operate with a fully charged battery pack.	The over-current protective function in the battery pack might be activated. Power off the computer for 1 minute to reset this function; then power it on again.

A Hard-Disk-Drive Problem

Problem	Cause and Action
The hard disk drive makes an intermittent rattling noise.	The rattling noise might be heard when: The hard disk drive starts accessing the data or when it stops. You are carrying the hard disk drive. You are carrying your computer. This is a normal characteristic of a hard disk drive and is not a defect.

CD-ROM Drive Problems

Problem	Cause and Action
The CD-ROM drive does not work.	Make sure that: The computer is powered on and a compact disc is properly loaded on the center pivot of the CD-ROM drive. (You should hear a click.) The CD-ROM drive connector is firmly connected to the computer. The CD-ROM drive tray is firmly closed. The device drivers are correctly installed. If the CD-ROM drive in the docking station does not work, do the following: 1. Click on **Start**. 2. Move the cursor to **Programs** and **ThinkPad**; then click on **ThinkPad Configuration**. 3. Click on **Docking Station** ( ). 4. Make sure that you checked **Enable IDE device in the docking station**. **Note:** Do not use IRQ 11 and 15 for the PCI device setting. 5. Click on **OK**.

Problem	Cause and Action
You hear a noise from the CD-ROM drive when the compact disc is spinning.	The CD-ROM drive cover might be bent. Have the CD-ROM drive serviced.
The CD-ROM tray does not open even if you press the CD-ROM eject button.	Insert a pin into the CD-ROM emergency eject hole and eject the CD-ROM tray.
The compact disc cannot be read.	Make sure that: The compact disc is not dirty. If it is, clean it with a CD-ROM cleaner kit. The compact disc is not defective. If it is, try another compact disc. The compact disc is placed in the tray with the label side up. The compact disc format conforms with one of the following: – Music CD – CD-ROM or CD-ROM XA – Multisession photo CD – Video CD

DVD-ROM Drive Problems

Problem	Cause and Action
The DVD-ROM does not work.	Make sure that: The computer is powered on and a DVD disc or a compact disc is in the DVD-ROM drive. The DVD-ROM drive connector is firmly connected to the computer. The DVD-ROM drive tray is firmly closed. The device drivers are correctly installed. If the DVD-ROM drive in the docking station does not work, do the following: 1. Click on **Start**. 2. Move the cursor to **Programs** and **ThinkPad**; then click on **ThinkPad Configuration**. 3. Click on **Docking Station** ( ). 4. Make sure that you checked **Enable IDE device in the docking station**. **Note:** Do not use IRQ 11 and 15 for the PCI device setting. 5. Click on **OK**.

Problem	Cause and Action
You hear a noise from the DVD-ROM drive when the DVD is spinning.	The DVD-ROM drive cover might be bent. Have the DVD-ROM drive serviced.
The DVD tray does not open even if you press the DVD eject button.	Insert a pin into the DVD emergency eject hole and eject the DVD tray.
The DVD cannot be read.	Make sure that: The DVD is not dirty. If it is, clean it. The DVD is not defective. If it is, try another DVD. The DVD is loaded on the center pivot of the DVD-ROM drive with the label side up. (You should hear a click.) The DVD format conforms with one of the following: – Music CD – CD-ROM or CD-ROM XA – Multisession photo CD – Video CD – DVD-ROM (DVD-video)

Infrared Communication Problems

Problem	Cause and Action
Your computer cannot communicate with other devices using the infrared port.	Make sure that: The communication speeds are the same. The infrared ports are clean. No objects are between the computer and the communicating device. The distance and angle between your computer and the device is within the specified range. You are not operating under direct sunlight. The infrared port is not directly facing the other communicating port. Communication is not impeded by light from the computer's LCD. To avoid this, open the LCD to a wide angle. The communication application running on your computer is compatible with that running on the other computer. Refer to the application manuals for more information.

Troubleshooting Charts

Problem	Cause and Action
Incorrect data is sent between your computer and a communicating device.	Make sure that: The distance and angle between your computer and the device is within the set range. The communication speeds are the same. There are no other devices that radiate infrared rays, such as remote-controlled devices or wireless headphones, near your computer or the communicating device. You are not operating under direct sunlight. No fluorescent lamps are near your computer or the communicating device.
You cannot use DMA channels for both the parallel connector and the infrared port.	If you enable ECP and choose DMA3 (the default value) for the parallel connector, you might be prompted if you want to disable DMA for the infrared port. To use DMA channels for both the parallel and infrared ports, do the following: 1. Click on **OK** to disable DMA for the infrared port. 2. Close a parallel port panel. 3. Click on the **Infrared device** button to open the infrared panel. 4. Choose DMA0 or DMA1 for infrared port on the panel. 5. If you see the panel prompting if you want to disable DMA for an audio device, click on **OK**.

An Enhanced Video or MPEG Problem

Problem	Cause and Action
The Enhanced Video function or the MPEG function does not work.	Make sure there are no resource conflicts (IRQ or I/O address). Enable the Enhanced Video or MPEG function by doing the following: 1. Click on **Start**. 2. Move the cursor to **Programs** and **ThinkPad**; then click on **ThinkPad Configuration**. 3. Click on **Video Capture/TV out** ( ). 4. Make sure that at least one IRQ is assigned for the PCI devices. If you find a conflict with other devices, change the IRQ value. (See "Resolving System Resource Conflicts" in the *Online User's Guide*). The MPEG playback and the video capture functions use the same hardware resources. Only one of the two functions can be used at the same time. Likewise, two MPEG functions cannot be used at the same time.

Audio or Telephony Problems

Problem	Cause and Action
The volume of the WaveTable MidiSynth device cannot be controlled.	Use the **Serial-in** control in the volume control panel to control the volume.
The voice quality over the Voice-Over-Data communication is poor.	Due to limitations of the ThinkPad modem, the voice quality that is transmitted and received over the Voice-Over-Data communication is not as good as with a normal telephone line. There may be momentary voice discontinuities, delays, or distortions.
Other problems.	Problems might be due to such other factors as: Incompatibility between the ThinkPad Modem feature and other adapter cards in the docking station. To isolate this problem to a card or device, remove the adapter cards in the docking station one by one, and run the Easy-Setup "Test" submenu. The telephone cable configuration is not correct for your application. The telephone cable is defective. The telephone is defective. The audio cable configuration is not correct for your application. The audio cable is defective. The audio equipment is defective.

A Universal Serial Bus (USB) Problem

Problem	Cause and Action
A device connected to the USB connector does not work.	Do the following: 1. Make sure that the USB device is connected correctly. 2. Open the “Device Manager” window, and make sure that the USB device setup is correct, and that the computer resource assignment and device driver installation are correct. **Note:** To open the “Device Manager” window, click on **Start** and move the cursor to **Settings** and **Control Panel**. Double-click on **Control Panel**, and **System**. Then click on the **Device Manager** tab in the “System Properties” window. Refer to “Testing Your Computer” on page 164 and run the Easy-Setup “Test” submenu for diagnostic test of the USB connector.

PC Card or Built-in Modem Problems

Problem	Cause and Action
The internal modem does not work when you start your computer from an operating system other than Windows 95.	The operating system might be sharing the same IRQ levels as your modem. The ThinkPad Modem software might not work under these conditions. You must cancel the IRQ shared condition to use the modem. To cancel the IRQ shared condition → *Online User's Guide*.
My modem application does not work with the ThinkPad modem.	Make sure that the internal modem port is enabled by opening the “Device Manager” window and running the **Modem Wizard** or by opening the ThinkPad Configuration program and doing as follows: 1. Click on **Start**. 2. Move the cursor to **Programs** and **ThinkPad**; then click on **ThinkPad Configuration**. 3. Click on **Internal Modem** ( ). 4. Select **Enable**. 5. Click on **OK**.
Your PC Card modem does not work.	Make sure that the infrared port is disabled and the modem is set up correctly by following the instructions in this book or manuals shipped with your PC Card modem.

Other PC Card Problems

Problem	Cause and Action
The PC Card shows "Ready," but it does not work correctly.	Make sure that: The system resources reserved for the PC Card do not conflict with other system devices. Refer to "Resolving System Resource Conflicts" in the *Online User's Guide*. The resources reserved for the PC Card match the settings in the application program. If you are using a modem card, check the COM number, I/O port address, and IRQ level. If you are using a network card, check the I/O port address, IRQ level, and memory window address. To check the resources assigned to the PC Card, click on **PC Card Slots** and the **Allocated Resources** tab in the ThinkPad Configuration program.
A system resource conflict occurred when a PC Card was used.	See "Resolving System Resource Conflicts" in the *Online User's Guide*.
PC Card support software does not recognize your PC Card.	Make sure that: If the PC Card is not a modem, an ATA, a Flash, or an SRAM card, you have the proper client device driver for the card. In Windows 95, the PC Card must have an INF file associated with it. Your PC Card supports PCMCIA Release 2.0, 2.01, or 2.10. Refer to the manual that came with your PC Card. If your PC Card does not support PCMCIA Release 2.0, 2.01, or 2.10, you cannot use PC Card Director. Contact your PC Card supplier. Your PC Card is working by following the diagnostic instructions for your PC Card, if any.
The PC Card is recognized by PC Card support software, but the "Not Ready" or "Not Configured" message is shown.	Make sure that: The PC Card enabler is installed. Refer to the manuals supplied with your PC Card. If the PC Card is not a modem, an ATA, a Flash, or an SRAM card, you have the proper client device driver for the card. In Windows 95, the PC Card must have an INF file associated with it. The resources for the PC Card are correctly reserved. Refer to "Resolving System Resource Conflicts" in the *Online User's Guide*.

Troubleshooting Charts

Problem	Cause and Action
The system cannot start from the PC Card.	To start from the PC Card, do as follows: 1. Start the ThinkPad Configuration program. 2. Click on the **UltraBay II** ( ) button. 3. Remove the check mark from the **Enable Hot/Warm Swapping of UltraBay II** check box by clicking on it. 4. Click on **OK**. Make sure that the correct system resources are being used for the PC Card. **ATA:** IRQ 15 I/O 170–177h, 376h **Note:** The secondary IDE should be disabled. **RPL (Token Ring):** IRQ 9 Memory: D6000–DBFFFh I/O A20–A23h **RPL (Ethernet):** IRQ 5 Memory D2000–D7FFFh I/O 300–31Fh
The PC Card is installed and configured, but it does not work.	**Modem card**: Make sure all settings in the “Modem Control” panel and in your communication application correspond and are correct. **SCSI card**: Make sure the correct driver for the SCSI card is installed. **Note:** SCSI cards can be inserted while you are operating your computer; however, it is recommended that you insert them at boot time. **Network card**: Make sure all network components are correctly installed. **Combo card**: Make sure the correct driver for the Combo card is installed. Restart the system, and then insert the Combo card.

Problem	Cause and Action
The computer is disconnected from the network when it attempts to accesses using a PC Card on battery operation.	Your computer limits the processor speed on battery operation to save battery life; however, some network cards do not allow processor control. Do as follows: 1. Click on **Start**. 2. Move the cursor to **Settings**; then click on **Control Panel**. 3. Double-click on the **ThinkPad Configuration** icon. 4. Click on **Power Management**. The "Power Management Properties" window appears. 5. Click on the **Power Mode** tab. 6. Make sure **Battery** is selected in the **Power Source** list box. If it is not, select **Battery**. 7. Click on the **Customized** radio button. 8. Select **Maximize** in the **Processor speed** list box under **Setting details**. 9. Click on **OK** to apply the change.

Docking Station or Port Replicator Problems

Problem	Cause and Action
The IDE CD-ROM drive or the hard disk drive in the docking station does not work.	Make sure that the system resources of the secondary IDE device in the docking station do not conflict with the system resources of the other devices. Do the following: 1. Click on **Start**. 2. Move the cursor to **Programs** and **ThinkPad**; then click on **ThinkPad Configuration**. 3. Click on **Docking Station** ( ), and put a check mark ( ) in the **Enable IDE device in the docking station** check box by clicking on it. **Note:** Do not use IRQ 11 and 15 for the PCI device setting. 4. Click on **OK**.

Troubleshooting Charts

Problem	Cause and Action
The MIDI connector on the port replicator does not work.	To enable the MIDI connector of the port replicator, use the ThinkPad Configuration program. Make sure that the MIDI connector is enabled by doing the following: 1. Start the ThinkPad Configuration program. 2. Click on **MIDI/Joystick Port**. 3. Confirm that the MIDI connector is enabled. If not, click on **Enable**; then click on **OK**. 4. Close the ThinkPad Configuration program and restart the computer. **Note:** When you restart the computer, you might need to install the MIDI driver. Follow the instructions on the screen and install the device driver for your computer's operating system.
The computer hangs when you power on or resume operation.	Make sure that: The AC Adapter is connected to the port replicator or docking station by following the instructions described in this book. The power-on indicator of the port replicator or docking station is on. The computer is securely attached to the port replicator, or the computer and the port replicator are securely attached to the docking station. If there is still a problem, refer to the manuals shipped with the port replicator and docking station.
The PC Card installed in a port replicator is not recognized and the PC Card slots are unusable.	Make sure that: The AC Adapter is connected to the port replicator. The power-on indicator of the port replicator is on. The computer is securely attached to the port replicator. This problem might happen when you reinstall Windows 98, or when you initialize the system with Easy-Setup.

A Printer Problem

Problem	Cause and Action
The printer does not work.	Make sure that: The parallel port is enabled. 1. Click on **Start**. 2. Move the cursor to **Programs** and **ThinkPad**; then click on **ThinkPad Configuration**. 3. Click on **Parallel Port** ( ). 4. Select **Enable**. 5. Click on **OK**. The printer is powered on and ready to print. The printer signal cable is connected to the correct connector of your computer. If these items are correct and the printer still does not work, run the tests described in the printer manual. If the tests show that the printer is OK, have the computer serviced.

External Monitor Problems

Problem	Cause and Action
The external monitor is blank.	Do the following: 1. Connect the external monitor to another computer to make sure it works. 2. Reconnect the external monitor to your computer. 3. Refer to the manual shipped with the external monitor to check the resolutions that are supported. 4. Start the ThinkPad Configuration program. 5. Select one of the **Display Device** buttons on the toolbar in the ThinkPad Configuration program: If the external monitor supports the same resolution as or a higher resolution than the LCD, click on **CRT Display Only** or **Both LCD and CRT Display**. If the external monitor supports a lower resolution than the LCD, click on **CRT Display Only**. (If you click on the **Both LCD and CRT Display**, the external monitor screen will be blank or distorted.)

Problem	Cause and Action
You cannot set a higher resolution than the present one on your external monitor.	Make sure that: The display driver is installed correctly by doing the following: 1. Click on **Start**. 2. Move the cursor to **Settings** and **Control Panel**. 3. Click on **Control Panel**, and then double-click on **Display**. 4. Select the **Settings** tab in the “Display Properties” window. 5. (Windows 98) Click on **Advanced...**. (Windows NT) Click on **Display Type**. Make sure that the ThinkPad display driver is installed in the adapter information window. 6. Click on the **OK** button. If you are not sure that the display driver is installed correctly, reinstall it. An appropriate monitor type is selected by doing the following: 1. Click on **Start**. 2. Move the cursor to **Settings** and **Control Panel**. 3. Click on **Control Panel**, and then double-click on **Display**. 4. Select the **Settings** tab in the “Display Properties” window. 5. Click on the **Advanced...** button. 6. Click on the **Monitor** tab. 7. Click on the **Change...** button. The “Update Device Driver Wizard” appears. 8. Select the **Next** button, and follow the instructions on the screen by selecting **Display a list of all the drivers in a specific location, so you can select the driver you want**, and then **Show all hardware**. 9. Select **Manufacturers** and **Models** for your monitor, and follow the instructions on the screen. 10. Click on the **OK** button to close the “Properties” window after updating the driver. 11. Set **Colors** and **Screen area** in the “Display Properties” window. 12. Click on the **OK** button.

Problem	Cause and Action
The screen is unreadable or distorted.	Make sure that: The display driver is installed correctly by doing the following: 1. Click on **Start**. 2. Move the cursor to **Settings** and **Control Panel**. 3. Click on **Control Panel**, and then double-click on **Display**. 4. Select the **Settings** tab in the "Display Properties" window. 5. (Windows 98) Click on **Advanced...**. (Windows NT) Click on **Display Type...**. Make sure that the ThinkPad display driver is installed in the adapter information window. The monitor is set correctly by doing the following: 1. Click on the **Advanced...** button in the **Settings** tab in the "Display Properties" window. 2. Click on the **Monitor** tab. Make sure you choose the correct monitor. 3. Click on **OK** to close the window. An appropriate refresh rate is selected by doing the following: 1. Click on the **Advanced...** button in the **Settings** tab in the "Display Properties" window. 2. Click on the **Adapter** tab. 3. Select the correct refresh rate for your monitor. If you are not sure, select **Optimal**. If the settings are correct, run the tests described in the manual supplied with the external monitor. If the tests show that the external monitor is OK, have the computer serviced.
Wrong characters appear on the screen.	Did you install the operating system or application program with the correct procedure? If you did, have the external monitor serviced.

A Television Problem

Problem	Cause and Action
The screen is blank.	Make sure that: You enabled the television settings. You need to enable the settings every time you start your computer to use the TV as the secondary display with the dual display function. You enabled the video-out connector (TV out) by doing the following: 1. Click on **Start**. 2. Move the cursor to **Settings** and **Control Panel**; then click on **Control Panel**. 3. Double-click on **Display**. 4. Select the **Settings** tab. If you see only one display icon in the “Settings” window, enable it “Using the Dual Display Function” on page 74. If you need to set the **TV Output Standards** and **Output Selection** in the procedure, make sure that you select the appropriate radio button under **TV Output Standards** box, and the **Composite** radio button under **Output Selections** box.

Other Option Problems

Problem	Cause and Action
An IBM option that you just installed does not work.	Make sure that: The option is designed for your computer. The option was installed according to the instructions supplied with the option or this book. Other installed options or cables are not loose. There is no I/O address or interrupt level (IRQ) DMA channel conflict. To see the system resource status, start the ThinkPad Configuration program and click on the respective device buttons. If the test program for the option did not find the problem, have the computer and option serviced.

Problem	Cause and Action
An IBM option that used to work no longer works.	Make sure that: The option is securely connected to your computer. The option passes its own test. If the option came with its own test instructions, use those instructions to test the option. There is no system resource conflict (→ "Resolving System Resource Conflicts" in the *Online User's Guide*). If these items are correct and the test program did not find the problem, have the computer and option serviced.
The serial connector does not work.	Make sure that the serial connector is enabled by doing the following: **For Windows 98:** 1. Start the ThinkPad Configuration program. 2. Click on **Serial Port** ( ). 3. Select **Enable**. 4. Click on **Device Manager**. 5. Check the ports in the "Device Manager" window and make sure the settings are correct. 6. Click on **OK**. **For Windows NT:** 1. Start the ThinkPad Configuration program. 2. Click on **Serial Port** ( ). 3. Select **Enable**; then select **COM1**, **COM2**, **COM3**, or **COM4**. 4. Click on **OK**.

Software Problems

Problem	Cause and Action
An application does not run correctly.	Check the following to make sure that the problem is not being caused by the application: Your computer has the minimum required memory to run the application. Refer to the manuals supplied with the application. The application is designed to operate with your operating system. Other applications run correctly on your computer. The necessary device drivers are installed → "Advanced" in the *Online User's Guide*. The application works OK when it is run on some other computer. If an error message appears when you are using the application program, refer to the manuals supplied with the application. If these items are correct and you still have a problem, contact your place of purchase or a service representative for help.
The main window bitmap in the ThinkPad Configuration program is distorted (Windows NT only).	Installing the **Active Desktop**, bundled with Internet Explorer Version 4.0 on Windows NT, might cause this problem. Do one of the following: Uninstall the **Active Desktop**. (Merely disabling the **Active Desktop** is not effective to avoid the problem.) Close the ThinkPad Configuration program and start it again. (This is a temporary recovery.)
$ $ $ $ $ An MS-DOS game does not run, or it stops running.	Such problems are caused by corruption between the real mode application and the SystemSoft PCMCIA drivers providing both real mode and protect mode. If the system starts in MS-DOS mode without your changing the system configuration at the time of purchase, the corruption does not occur. Therefore, there is no problem with playing an MS-DOS game. Restart the system in MS-DOS mode, as follows: 1. Click on **Start**. 2. Click on **ShutDown**. The "Shut Down" window appears. 3. Click on **Restart the computer in MS-DOS mode?** 4. Click on **Yes**. The system restarts in MS-DOS mode. Run the game in this mode.

Other Problems

Problem	Cause and Action
The computer locks or does not accept any input.	Your computer might lock when it enters suspend mode during a communication operation. Disable the suspend timer when you are working on the network. If you power on the computer with OS/2 Warp installed, make sure no disc is in the CD-ROM or DVD-ROM drive. If there is, remove it, power off the computer and power it on again. To power off the computer, press the power shutdown switch using the tip of a ballpoint pen.
The computer does not power off with the power switch.	If the suspend indicator is on and you are working under battery power, change the battery to a fully charged one or change your power source to ac power. If you still have a problem, press the power shutdown switch using the tip of a ballpoint pen.
The computer does not start from a diskette.	Make sure that the startup sequence in Easy-Setup is set so that the computer starts from the diskette drive (see “Easy-Setup” on page 17).

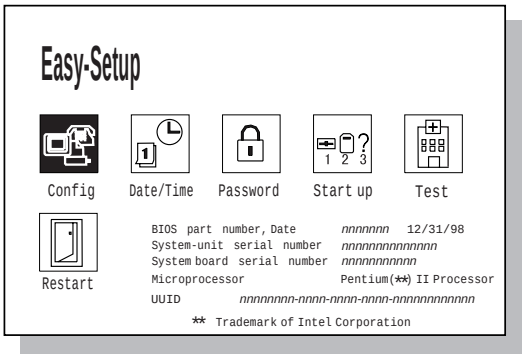
Testing Your Computer

If you still have a problem with your computer after using the Troubleshooting Charts, test the computer using the **Test** function of Easy-Setup.

To test your computer, do the following:

1. Make sure that the speaker volume control is in the middle position.

2. Press and hold **F1**; then power on the computer to start Easy-Setup. Hold **F1** until the following Easy-Setup menu appears:



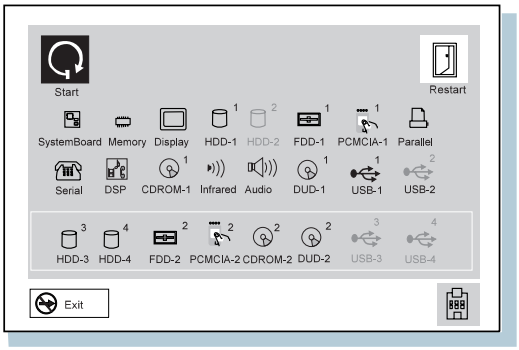
You will hear a short beep. If you are not sure whether you heard a beep, adjust the speaker volume. Power off the computer and try again. If you still don't hear a beep, the speaker is not working. Have your computer serviced.

3 Select the **Test** icon; then select the **Start** icon or press **Enter**.

NOTE

Do not touch the keyboard or the pointing device during the test.

A window such as the following appears. The devices shown in the window are associated with features and options of your computer.



If you cannot go to the next menu, have your computer serviced.

If an X appears to the left of a device with an error code below it, make a note of the error code and have the computer serviced.

NOTE

If you have the SelectaDock I or II docking station as an option with your computer, you need to create the diagnostic diskette to test the SelectaDock docking station. This diskette replaces the diagnostic portion of existing SelectaDock I or SelectaDock II Option Diskette. Do the following:

1. Create the SelectaDock I/II Diagnostic Diskette, using the Diskette Factory program preinstalled on the hard disk.
2. Connect your computer to the SelectaDock I or II docking station.
3. Start from the SelectaDock I/II Diagnostic Diskette. Follow the instructions on the screen.

Testing Your Computer

Appendix A. Features and Specifications

This appendix describes features and specifications for the computer.

Features

Processor

Intel Mobile Pentium II processor

Memory

Built-in: 128 MB or 64 MB
Option: Maximum 320 MB

Storage devices

Customer-upgradable 2.5-inch hard disk drive

Display

The color display uses TFT technology

Up to 1280-by-1024 resolution on the 13.7-inch LCD
Up to 1024-by-768 resolution on the 14.1-inch LCD
Up to 1600-by-1200 resolution on an external monitor
Brightness control

Keyboard

84-key, 85-key, or 89-key
TrackPoint
Fn key function

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Features

External diskette drive

To get the best performance from your diskette drives, use high-quality diskettes (such as IBM diskettes) that meet or exceed the following standards:

1-MB, 3.5-inch, unformatted diskette:

- ANSI (American National Standards Institute) X3.137
- ISO (International Standards Organization) 8860
- ECMA (European Computer Manufacturers Association) 100

2-MB, 3.5-inch, unformatted diskette:

- ANSI X3.171
- ISO 9529
- ECMA 125

External interface

Serial connector (EIA-RS232D)

Parallel connector (Centronics)

External input-device connector

External-monitor connector

External-diskette-drive connector

Expansion connector

PC Card slots (two Type I or Type II PC Cards, or one Type III PC Card)

Headphone jack

Microphone/line-in jack (supports a dynamic microphone or a self-battery-powered condenser microphone)

Infrared port

Universal Serial Bus (USB) connector

Telephone connector

Data modem functions

Asynchronous communication port interface (NS16550A UART compatible) operation

ITU-T V.34 up to 33.6 Kbps-data modem with data rates of 2400, 4800, 7200, 9600, 12000, 16800, 19200, 21600, 24000, 26400, 31200, and 33600 bps.
ITU-T V.32bis protocols with data rates of 4800, 7200, 9600, 12000, and 14400 bps
ITU-T V.32 protocols with data rates of 4800, 9600 uncoded, and 9600 bps Trellis coded
ITU-T V.21/V.22, V.22bis protocols with data rates from 300 bps to 2400 bps
Hayes** AT command set compatibility
Asynchronous error recovery protocol
Microcom Network Protocol (MNP**) protocols
- Error correction via MNP classes 1–4
- Data compression via MNP class 5 and V.42bis
- MNP class 5 for up to 2x data compression

VoiceView (Windows 98 and Windows 95 only)
U.S. Robotics 56K Technology** Protocol with data rates of 56 Kbps (Windows 98, Windows 95, and Windows NT only)

Facsimile (fax) modem functions

Class 1 fax modem
Class 2 fax modem
G3 transfers
ITU-T T.4 and T.30 operations
ITU-T V.27ter-2400/4800 bps send/receive
ITU-T V.29-7200/9600 bps send/receive
ITU-T V.17-14400 bps send/receive

Specifications

Size

Width: 313 mm (12.0 in.)
Depth: 254 mm (9.7 in.)
Height: 55.5 mm (2.1 in.)

Environment

Note:
When you charge the battery pack, its temperature must be at least 10°C (50°F).

Temperature (at altitudes less than 2438 m [8000 ft]):

- Operating with no diskette: 5° to 35°C (41° to 95°F)
- Operating with a diskette: 10° to 35°C (50° to 95°F)
- Nonoperating: 5° to 43°C (41° to 109°F)

Relative humidity:

- Operating with no diskette in the drive: 8% to 95%
- Operating with a diskette in the drive: 8% to 80%

Maximum altitude: 3048 m (10,000 ft) in unpressurized conditions

- Maximum temperature at 3048 m (10,000 ft): 31.3°C (88° F)

Heat output

56 W (191 BTUs/hr) maximum

Electrical (AC Adapter)

Sine-wave input, at 50 to 60 Hz, is required
The input rating of the AC Adapter: 100–240 V ac, 50/60 Hz

Lithium-ion battery pack

Nominal voltage: 10.8 V dc
Capacity: 4.8 AH

IBM Power Cords

The use of an improper power cord might cause severe damage to your computer.

To use the AC Adapter outside the country where you purchased your computer, you need an ac power cord that is certified for the country you are visiting. You can purchase one through an IBM authorized reseller or IBM marketing representative in that country.

For 2-pin power cords:

IBM Power Cord Part Number	Used in These Countries
13H5264	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
13H5267	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China (including Hong Kong), Qatar, Singapore, United Kingdom
13H5270	Austria, Bosnia-Herzogovina, Belgium, Bulgaria, Chile, Croatia, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Israel, Italy, Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Yugoslavia
13H5273	Japan
13H5276	Argentina, Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay
13H5279	Bangladesh, Pakistan, South Africa, Sri Lanka

The grounded adapter is required for full MPRII compliance. If a 3-pin power cord came with your computer → “Safety Information” on page xii.

IBM Power Cords

For 3-pin power cords:

IBM Power Cord Part Number	Used in These Countries
02K0539	People's Republic of China (other than Hong Kong)
76H3514	Argentina, Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay
76H3516	Aruba, Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
76H3518	Austria, Belgium, Bosnia-Herzogovina, Bulgaria, Croatia, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Macao, Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey, Yugoslavia
76H3520	Denmark
76H3522	Bangladesh, Myanmar, Pakistan, South Africa, Sri Lanka
76H3524	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Malaysia, Nigeria, Oman, Qatar, Singapore, United Kingdom
76H3528	Liechtenstein, Switzerland
76H3530	Chile, Ethiopia, Italy, Libya
76H3532	Israel
76H3535	Korea

Appendix B. Product Warranty and Notices

International Business Machines Corporation Armonk, New York 10504

Statement of Limited Warranty

The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you originally purchase for your use, and not for resale, from IBM or an IBM authorized reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. Machines are subject to these terms only if purchased in the United States or Puerto Rico, or Canada, and located in the country of purchase. If you have any questions, contact IBM or your reseller.

Machine: IBM ThinkPad 770X and the Battery Pack

Warranty Period*: Three Years, One Year on Battery

**Elements and accessories are warranted for three months. Contact your place of purchase for warranty service information.*

Production Status

Each Machine is manufactured from new parts, or new and serviceable used parts (which perform like new parts). In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

The IBM Warranty

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. IBM calculates the expiration of the warranty period from the Machine's Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period, IBM or your reseller will provide warranty service under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine. IBM or your reseller will specify the type of service.

For a feature, conversion, or upgrade, IBM or your reseller may require that the Machine on which it is installed be 1) the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Some of these transactions (called "Net-Priced" transactions) may include additional parts and associated replacement parts that are provided on an exchange basis. All removed parts become the property of IBM and must be returned to IBM.

Replacement parts assume the remaining warranty of the parts they replace.

If a Machine does not function as warranted during the warranty period, IBM or your reseller will repair or replace it (with a Machine that is at least functionally equivalent) without charge. If IBM or your reseller is unable to do so, you may return it to your place of purchase and your money will be refunded.

If you transfer a Machine to another user, warranty service is available to that user for the remainder of the warranty period. You should give your proof of purchase and this Statement to that user.

Warranty Service

To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at **1-800-772-2227**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.

Depending on the Machine, the service may be 1) a "Repair" service at your location (called "On-site") or at one of IBM's or a reseller's service locations (called "Carry-in") or 2) an "Exchange" service, either On-site or Carry-in.

When a type of service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced.

It is your responsibility to:

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Product Warranty

1. obtain authorization from the owner (for example, your lessor) to have IBM or your reseller service a Machine that you do not own;
2. where applicable, before service is provided —
   a) follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,
   b) secure all programs, data, and funds contained in a Machine,
   c) inform IBM or your reseller of changes in a Machine's location, and
   d) for a Machine with exchange service, remove all features, parts, options, alterations, and attachments not under warranty service. Also, the Machine must be free of any legal obligations or restrictions that prevent its exchange; and
3. be responsible for loss of, or damage to, a Machine in transit when you are responsible for the transportation charges.

Extent of Warranty

IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless IBM specifies otherwise, IBM provides non-IBM machines on an “AS IS” basis. However, non-IBM manufacturers may provide their own warranties to you.

Misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, removal of product labels or parts identification labels, or failure caused by a product for which IBM is not responsible may void the warranties.

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In Canada, warranties include both warranties and conditions.

Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Limitation of Liability

Circumstances may arise where, because of a default on IBM's part (including fundamental breach) or other liability (including negligence and misrepresentation), you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages, IBM is liable only for:

1. bodily injury (including death), and damage to real property and tangible personal property; and
2. the amount of any other actual loss or damage, up to the greater of $100,000 or the charge for the Machine that is the subject of the claim.

Under no circumstances is IBM liable for any of the following:

1. third-party claims against you for losses or damages (other than those under the first item listed above);
2. loss of, or damage to, your records or data; or
3. economic consequential damages (including lost profits or savings) or incidental damages, even if IBM is informed of their possibility.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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Year 2000 Readiness and Instructions

A product is Year 2000 Ready if the product, when used in accordance with its associated documentation, is capable of correctly processing, providing, and receiving date data within and between the 20th and 21st centuries, provided all other products (for example, software, hardware, and firmware) used with the product properly exchange date data with it.

This IBM PC hardware product has been designed to process four-digit date information correctly within and between the 20th and 21st centuries. If your IBM computer is on when the century changes, you should turn it off and then back on again once, or restart the operating system, to ensure that the internal clock resets itself for the new century.

This IBM PC product cannot prevent errors that might occur if software you use or exchange data with is not ready for the Year 2000. IBM software that comes with this product is Year 2000 Ready. However, software from other companies might come with this IBM PC product. IBM cannot take responsibility for the readiness of that software. You should contact the software

developers directly if you wish to verify readiness, understand limitations, or look for any software updates.

To learn more about IBM PC products and the Year 2000, visit our Web site at http://www.pc.ibm.com/year2000. The information and tools there can help you with your Year 2000 transition plan, especially if you have multiple IBM PCs. IBM encourages you to check periodically for updated information.

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RediSafe
ThinkPad
TrackPoint

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Other company, product, and service names, which may be denoted by a double asterisk (**), may be trademarks or service marks of others.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

ThinkPad 770X, model number 9549

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.
Increase the separation between the equipment and receiver.
Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, NY 10504
Telephone 1-919-543-2193

Industry Canada Class B Emission Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B est conform à la norme NMB-003 du Canada.

European Community Directive Conformance Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electro-magnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

A declaration of Conformity with the requirements of the Directive has been signed by IBM United Kingdom Limited, PO BOX 30 Spango Valley Greenock Scotland PA160AH.

This product satisfies the Class B limits of EN 55022.

Telecommunication Notices

Federal Communications Commission (FCC) and Telephone Company Requirements (Part 68 of the FCC Rules)

1. The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent, and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual.

   In order to program this information into your computer, you should be sure to follow the installation instructions for your fax software package.

2. The built-in modem is built into the ThinkPad computer. It complies with Part 68 of the FCC Rules. A label is affixed to the bottom of the computer that contains, among other things, the FCC registration number, USOC, and Ringer Equivalency Number (REN) for this equipment. If these numbers are requested, look at the label and provide this information to your telephone company.

3. The REN is useful to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all, areas, the sum of the RENs of all devices should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your local telephone company to determine the maximum REN for your calling area.

4. If the built-in modem causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But, if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

5. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

6. If you experience trouble with this built-in modem, contact your IBM Authorized Seller, or the IBM Corporation, 500 Columbus Avenue, Thornwood, NY 10594, 1-800-772-2227, for repair/warranty information. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected, or until you are sure the equipment is not malfunctioning.

7. No customer repairs are possible to the modem. If you experience trouble with this equipment, contact your Authorized Seller or the IBM Corporation for information.

8. The modem may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.

9. When ordering network interface (NI) service from the Local Exchange Carrier, specify service arrangement USOC RJ11C.

Industry Canada Requirements

Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications networks protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of communication. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs of alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The **Ringer Equivalent Number** (REN:0.5) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Number of all the devices does not exceed 5.

Avis

L'étiquette du ministère de l'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. Dans certains cas, les fils intérieurs de l'entreprise utilisés pour un service individuel à ligne unique peuvent être prolongés au moyen d'un dispositif homologué de raccordement (cordon prolongateur téléphonique interne). L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empechent pas la dégradation du service dans certaines situations. Actuellement, les entreprises de

télécommunication ne permettent pas que l'on raccorde leur matériel à des jacks d'abonné, sauf dans les cas précis prévus par les tarifs paticuliers de ces entreprises.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement

L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à électricien, selon le cas.

L'indice de charge (IC) assigné à chaque dispositif terminal indique (REN:0.5), pour éviter toute surcharge, le pourcentage de la charge totale qui peut être raccordée à un circuit téléphonique bouclé utilisé par ce dispositif. La terminaison du circuit bouclé peut être constituée de n'importe quelle combinaison de dispositifs, pourvu que la somme des indices de charge de l'ensemble des dispositifs ne dépasse pas 5.

Patent Protection Notice

The following notice applies to machines equipped with DVD and TV out function:

> This device is protected by U.S. patent numbers 4631603, 4577216, 4819098, and other intellectual property rights. The use of Macrovision's copy protection technology in the device must be authorized by Macrovision and is intended for home and other limited pay-per-view use only, unless otherwise authorized in writing by Macrovision. Reverse engineering or disassembly is prohibited.

Notice for Australia

The following notice applies when using the telephony functions:

> FOR SAFETY REASONS, ONLY CONNECT AUSTEL PERMITTED OR CERTIFIED EQUIPMENT.

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